AMERICAN BEE JOURNAL

JUNE, 1921

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DIAMOND MATCH CO., Apiary Department, Chico, Cal.

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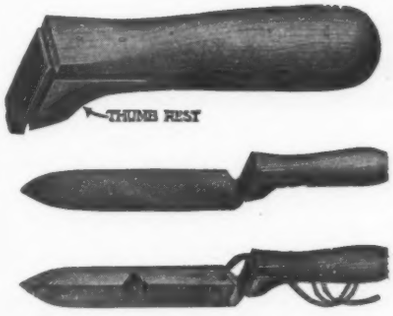

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A SUPERIOR QUALITY AT LESS COST

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¶ Joe started working in the Dadant factory when the whole process was by hand.

¶ Boards were dipped in hot wax, the resulting sheets being piled to cool, and eventually milled on hand mills.

¶ Foundation trimming, papering, lumber sawing, boxing, all was done by hand.

"JOE" SAUGIER

¶ During Joe's time enough Dadant's foundation has been made to fill two million hives and 150 million sections, with full sheets.

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¶ We invite letters of honest criticism on Dadant's Foundation. Joe wants them, we want them, that we may if possible increase the value of our product to the beekeeper and his bees. This follows our policy of continuous improvement of **Dadant's Foundation.**

¶ Comparison of **Dadant's Foundation** with others from the mill or under test with the hive invited.

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AMERICAN BEE JOURNAL

VOL. LXI—NO. 6 HAMILTON, ILL., JUNE, 1921 MONTHLY, $1.50 A YEAR

The Honey Producing Possibilities in North Carolina

By Vernon R. Haber, North Carolina State Department of Entomology

BY botanists the plants of North Carolina long have been recognized as unsurpassed in variety by those of any other State, with the probable exception of certain States bordering upon the Gulf of Mexico. The flora of this State is intermediate between those of northern and more southern botanical districts, for it is within North Carolina's boundaries that many typically northern plants reach their southern distribution limits, and some of those which typify southern flora have their most northern dispersal limits.

An additional feature which makes possible a much greater variety in the vegetation is that the mountains bordering the western extreme are sufficiently high that the difference in elevation existing between them and the ocean is equivalent to that of from 10 to 12 degrees of latitude. Upon the higher summits of these mountains occur species in both the fauna and flora which are peculiar to those of the mountain regions of New Hampshire, northwestern New York and Canada.

That North Carolina lies in a transition zone is a fact long recognized. The State is located approximately between the parallels 34 degrees and 36½ degrees north latitude, and between the meridians 75½ degrees and 84½ degrees west longitude. From eastern to western extremes it is 503¼ miles long, its most extreme (north and south) width is 187½ miles, with an average of 100 miles. The area of the State is 52,286 square miles, of which 48,666 square miles are land and 3,620 square miles are water. Swampy regions occur chiefly along the Atlantic coast. Their area is approximately 4,500 square miles.

Concerning plant distribution, there are three rather distinctly marked districts or regions in the State. Naming them from east to west they are: (1) the Coastal Plain, (2) the Piedmont or foothills, (3) the Mountain.

The Coastal Plains

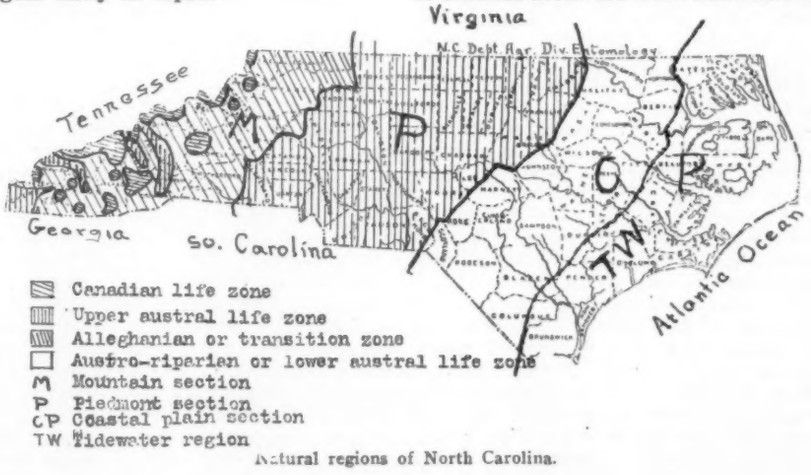
The coastal plains region lies in the Austro-riparian or Lower Austral Life Zone. It extends from the ocean inland about 200 miles to the eastern limit of the Piedmont section, and contains approximately half the land area of the State. The soil is composed of clay, silt and sand. The most eastern portion of the coastal plains frequently is referred to as the tide water region. It contains numerous rivers, lakes or swamps. The climate is of a marine character. The influence of the adjacent ocean lessens chances for abrupt temperature changes, both daily and seasonal and favors a fair average rainfall, which is of rather even seasonal distribution. The normal average precipitation for this region is 54 inches.

These conditions encourage the growth of the following favorite nectar-producing plants: Tupelo or gum trees, gallberry, huckleberry, holly and yellow poplar or tulip. The tupelos and rattan occur in thousands of acres of swamp land and along rivers, while the gallberry, huckleberry and holly usually grow upon the higher soils. The honey flow usually begins early in April.

The coastal plains offer the best opportunities for apiculture. The possibilities for honey production on a commercial basis are indicated by the numerous apiaries which contain over 100 colonies. There is a fair average in honey production, regardless of the fact that in many instances strictly modern apicultural methods are not practiced. Some apiaries contain from 200 to 250 colonies and report average productions of from 45 to 50 pounds of honey. In 1910 eight counties of this section reported 25,500 colonies and a yield of 247,000 pounds of honey. There is an abundance of unoccupied territory in the lowlands of the eastern counties which is well adapted to apiculture.

The Mountain Region

Among the mountains the elevation influences predominate, for the summers are cooler; the winters are more severe than in the east, but mild as compared to those of the middle northern States. The dryness of the atmosphere renders the climate a healthful one. The normal average precipitation for the region is 55 inches. The area of the mountain plateau is about 6,000 square miles. It extends from the Tennessee line to



Natural regions of North Carolina.

the Blue Mountains. The valleys are fertile, affording some of the most profitable farming areas. This area includes about one-sixth of the land area of the State. It is included mostly within the Alleghanian Life Zone, although upon the higher mountains one comes into the Canadian, while here and there it is interspersed with the Upper Austral or Carolinian. Forests everywhere are composed of numerous kinds of trees. More than 100 different kinds are recorded. The more prominent bee-visited plants are tulip poplar, basswood, sourwood and the clovers. Other plants which yield available nectar are maple, fruit trees, wild cherry, locust, sumac, goldenrod and aster. The honey flow usually begins about mid-May for tulip, and in latter June for basswood and sourwood. Usually the fall flow from aster is sufficiently heavy to supply all colonies with an abundance of honey for wintering purposes. Sourwood is more abundant upon the eastern slope of the Blue Ridge Mountains and in the counties west of Yancey. Basswood is of common occurrence upon the larger mountains and usually is more abundant upon the northern slopes. Buckwheat is raised extensively in Alleghaney, Watauga, Ashe and Avery Counties. Tulip poplars are abundant throughout most of the mountain regions. The best localities are in the sourwood regions or where there are mixtures of sourwood and basswood. There is much unoccupied territory in the mountains, but the beekeepers must exercise careful judgment in selecting localities, for most of the honey comes from forest trees and in certain localities the timber has been mostly removed.

Piedmont Plateau

Between the previously mentioned regions is the Piedmont Plateau. The Piedmont Plateau extends from the Blue Ridge Mountains eastward to the western limits of the Coastal Plain. In it may be found all gradations of climate between those just mentioned. The climatic conditions of this region favor the growth of a great variety of field, garden and orchard crops. The normal average precipitation is 52 inches. It lies in the Upper Austral or Carolinian Life zone. It is the general farming section and includes about one-third the land area of the State. It has no especially favored localities for honey production, excepting that the upper portions (those nearest the mountains) have a more luxuriant growth of sourwood. The favorite nectar-yielding plants are tulip-poplar, sourwood and the clovers, both crimson and alsike. Many other plants are of nectar-yielding importance. Among them are persimmon, holly, black gum, goldenrod, aster, willow, cow peas, sumac, blackberry, maple and fruit trees. Frequently surplus honey is made from the nectar of aster, which usually yields a prolonged autumn supply. The nectar-producing plants are of rather uniform distribution over the entire area. The honey flow usually begins in mid-April. There are many beekeepers, but the number of colonies kept by each (taken on the average) is rather small. In several counties there are apiaries which contain more than 100 colonies. Many kinds of plants of this section are not reliable sources of nectar every year, but very seldom is there complete failure, and good beekeeping practices soon should overcome any objectionable features which may present themselves. Often from 25 to 30 pounds of surplus honey per colony are produced in autumn from aster alone. The best locations usually are along creeks and rivers, where tulip poplar is more plentiful.

General Conditions

The mean temperature for the State is 59 degrees F. By seasons it is: Spring, 58 degrees; summer, 76 degrees; autumn, 60 degrees, and winter, 48 degree. Usually January is the coldest month, with an average temperature of 31 degrees, while July, with its average temperature of 81 degrees, is the warmest. The normal average precipitation for the entire State is 52 inches. Although the rainfall is rather uniformly distributed throughout the year, during the months that crops require most moisture, usually, the amount received is the greatest.

Throughout the entire State surplus nectar is obtained from trees and shrubs, comparatively few kinds of which are of much importance in that particular. Among important sources are tulip poplar, basswood, sourwood, tupelos, gallberry and clovers. Sourwood is found chiefly in the mountains and upper Piedmont sections. Clover is most abundant in the Piedmont regions. Tupelos and gallberries are restricted to coastal plains, chiefly to the tide water regions. Especially is this true of tupelos, while gallberries usually occur further inland upon the coastal plains. Tulip trees are found wherever bees are kept, but are most abundant in the mountains. They rank among the most constantly reliable and the heaviest yielders of nectar. The trees bloom in early spring, and in the Coastal Plain section there is an exceedingly early flow from tupelos and gallberry.

In most localities the main honey flow comes early in spring and in the Coastal Plains section it comes exceedingly early. Ordinarily this necessitates exceptionally good beekeeping practices if a maximum honey yield is to be expected. Most of the literature has been produced by beekeepers in the clover sections of the North, where the honey flow comes later and as a consequence, where the colonies in spring have a longer preparation period for it. In these regions usually the queens are longer-lived, for they have longer rest periods during the winters; but the fundamental requisites for maximum honey production are the same everywhere, in that the colonies must reach the maximum point of brood-rearing just previous to the beginning of the main honey flow. In other words, the period of maximum honey flow must be met with an excess number of individuals (that is, an excess number to that ordinarily or usually present). In the South, this spring preparation period is very short, making prompt apicultural practices preparatory to honey flow necessary in rather a more limited or shorter time than they are where the spring preparation period is longer. To meet such requirements most successfully, the bees should have passed the previous autumn under favorable environmental circumstances, such as can result only from the best of apicultural methods. In North Carolina the beekeepers' autumn begins in about mid-August, and after that date a sufficient number of bees must be reared to successfully over-winter the colony.

Raleigh, North Carolina.

STATE AND LOCAL ORGANIZATION

By E. S. Miller

Now that the success of the American Honey Producers' League seems assured, it would appear that the honey producers of each State should organize along business lines. The old form of beekeepers' association, with its social and educational features, has served its purpose in the past and doubtless will continue to do so in the future, but the time has arrived when the most important problem for beemen is not the increase of production nor the multiplication of beekeepers. To increase production without increasing marketing facilities means lower prices; it means more honey carried over from year to year with consequent loss to the producer; it means the ultimate junking of high-priced equipment by those forced out of the business. But production is increasing enormously, and there is a prospect of a vastly greater increase in the future. To those with foresight it is evident that something must be done to bring about a more effective method of marketing if the business is to be conducted on a profitable basis.

Honey producers are beekeepers, but only a small percentage of beekeepers are producers of honey to any noticeable degree. It is, therefore, impossible to organize beekeepers, as such, along commercial lines. I believe, however, that honey producers can and will be organized, and the purpose and objects of such an organization should coincide with those of the National League. Its work may be outlined as follows:

1. Marketing—
   Supervision of grading.
   Advertising.
   Standardization of package.
   Crop and market reporting.
   Distribution.
2. Education—
   Disease control.
   Dissemination of information.
3. Equipment—
   Standardization.
   Securing and disposing of bees.
   Purchasing of supplies.

4. Legislation—
Appropriations.
Other legislative matters.

In view of the fact that more honey is being produced than can be disposed of under present marketing conditions, the question of distribution and marketing, as above stated, is a matter of prime importance to those in the business commercially. What is the solution of this problem? As a suggestion, I will venture to offer the following:

Let local units be established; the county, perhaps, being the unit. Where conditions will warrant, elect manager or special agent who will inspect and grade, according to specified rules, all honey belonging to its members and which is to be placed on the market under a State or National seal or guarantee. A State inspector of honey should visit the various local centers from time to time to determine the conditions of sanitation under which honey is being put up and to see that the proper grading rules are enforced. Only members of the State and local organigations are to be permitted the use of the seal, and only after proper local or State inspection.

The State organization may be in the form of a producers' league or association which shall provide for supervision of local exchanges, authorize the use of the seal under stated restrictions and provide a penalty for its misuse; require of local exchanges a semi-monthly report of crop and marketing conditions on blanks provided for the purpose, report to local agents suitable information concerning crops and marketing, report to the national body, which in turn will report to the State membership through the State manager. The State Central Association, through its manager, should serve as a bureau of information in the distribution of honey, bees and equipment, furnishing information both to buyer and seller, thus avoiding unnecessary freight charges to and from large distributing centers as under the present system, and largely eliminating the profits of numerous handlers which often increase the cost to the consumer to three times the amount received by the producer. In case of shortage or surplus within the State, the manager, through the American Honey Producers' League can be placed in communication with conditions of supply or demand outside the State. A system of advertising of League honey should be carried on in the State by the State Association and local advertising by the local agents with the advice and assistance of the State manager. The State manager should, through the local exchanges, see that every retail grocer is constantly supplied with certified honey, put up in standard containers bearing the seal of the National League.

It should be the duty of the State organization to work in harmony with the American Honey Producers' League in the matter of grading and standardization of packages as well as in crop reporting and marketing and in the dissemination of information. In forming a State League, buyers, supply dealers and all allied interests should be permitted an associate membership.

In order to carry out the plan outlined, a considerable amount of money will be necessary, but I am confident that producers are willing to pay for actual service that will assist in making the business profitable. The project may be financed in one or more of several ways. The manner of securing funds must be determined by the needs of the associations formed. The following is suggested:

1. A charge for use of seal.
2. A membership fee with privilege of use of seal.
3. A charge for inspection of honey.
4. A commission on sales through County or State Manager.
5. A per colony tax on bees belonging to members.

Under a system of careful inspection and grading, an approved system of handling, proper advertising of certified product under National seal, honey should bring a higher price and no real producer can afford to stay out of the association. In case honey not certified is sold by non-members, either at a higher or lower price, it will not materially affect the retail price of certified honey.

Is the scheme outlined above practicable? Probably in certain States and under certain conditions it would not be. I am offering it as a suggestion only, and many defects doubtless will appear. Many difficulties will be encountered in putting it into operation, but after eliminating the unworkable features, I believe that here is the nucleus of the system which ultimately will prove practicable and will bring about a better distribution and consequently an increased demand and better prices for our product. What do you think?

Indiana.

Mr. Alex. Livshitz, of Palestine, and the senior editor. Mr. Livshitz's visit was mentioned in our May number.

TWO AND ONE-HALF PER CENT

By E. G. LeStourgeon

Steady now, beekeepers. Don't jump to any rash conclusions. The heading of this article does not refer to any ruling of Mr. Kramer relative to the "kick" allowed in "home-brew." Things are not always what they seem.

The other day I took a look at a whole lot of statistics. Let us say, musty statistics. All good writers now-a-days use the good word "musty" when referring to statistics. Anyhow your humble scribe was doing this very musty thing in the hope of finding a moral for the beekeepers of America. While absorbed in this more or less meritorious but very slightly remunerative task, we (note the modest pronoun), discovered that there are over 80,000 beekeepers in the United States. Now this must be true, because several sets of the aforesaid musty statistics average the same, and no one has contradicted it.

As we (still modest), delved more deeply into the figures of the erudite and bespectacled statisticians and their array of facts and figures we uncovered the 2½ percent that we started our sermon about. No, assuredly, it was not alcoholic content. It was something good. While being good, it was small, pitifully small. It is up to you, dear reader, to tell me why it was so small, and to help make it larger.

We issued, last month, a bulletin of the American Honey Producers' League. We mailed it to exactly 2,280 beekeepers. We mailed it to every member of the League and many who we hoped would become members. We mailed it to 2½ per cent, only, of the beekeepers of America.

The League movement has been on foot nearly two years and only 2½ per cent of the beekeepers of America are enrolled. Why? How much have you done? Do the beekeepers of America want a National League? Do you want one badly enough to send in some names for us to send our literature to?

Whether your State is affiliated or not, you can become a sustaining member of the League upon the payment of $10 into the League treasury. The League needs the money. It is doing a great and good work for the beekeepers of America, and you can help yourself and the honey-producing industry by giving the League your financial and moral support. We are awaiting your answer. This is a personal message to YOU and to every American beekeeping interest. Are we only 2½ per cent, or are we 100 per cent interested in our business?

San Antonio, Texas.

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language.
Published Monthly at Hamilton, Illinois.

Entered as second-class matter at the Postoffice at Hamilton, Illinois.

SUBSCRIPTION RATES—In the United States and Mexico, $1.50 per year; five years, $6. Canadian postage 15 cents, and other foreign countries 25 cents extra, per year.

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THE STAFF

C. P. DADANT .....Editor
FRANK C. PELLETT .....Associate Editor
MAURICE G. DADANT .....Business Manager

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THE EDITORS' VIEWPOINTS

Government Recognition of Beekeeping in France

An unknown friend sends us a copy of the April 8th number of the "Journal Officiel" of the French Republic, in which we find a speech by Senator D'Estournelles de Constant, comparing recovering France to "a hive which barbarians have devastated, but whose bees are reconstructing their home." From this simile, he turns to a consideration of beekeeping and calls attention to the fact that bees "not only furnish the honey which would have proved so serviceable in war time, but are a blessing for several of our crops. Bees are the hyphen between the flowers in our meadows as well as in our orchards. They fertilize our gardens, our plains and even our mountain slopes."

This leads to an eulogy of beekeeping and of the products of the bees, while mentioning the writers on bees from Virgil to Maeterlink and Bonnier. The upshot of this speech is a demand for a greater official recognition of beekeeping and laws to absolutely prohibit the sale of artificial honeys. A promise is made for greater recognition of beekeeping in the Agricultural Ministry, in future.

A Similie on Bees in Homer's Iliad

We have just mentioned a similie on bees in the speech of the French Senator D'Estournelles de Constant. We find in the New Standard Dictionary a quotation from Anthon's Homer:

"As the bees came forth continually in fresh numbers, so fresh bands of Greeks keep continually pouring forth from the ships and tents."

Bees often prove a good example to human beings.

Misunderstanding

It seems that some have not understood the reference to the failure of the Aluminum Honeycomb Company which appeared in our December 1920 issue. This w s the original Aluminum Honeycomb Company, of California, and not the Texas Company, which manufactures a similar comb. The company first organized was placed in the hands of a receiver some months ago. Later the equipment was sold to Duffy-Diehl, of Pasadena We believe that both firms now advertising aluminum combs in this journal are responsible, and that they will fill orders promptly. We especially regret that one foreign bee paper confused the bankrupt concern with the Aluminum Honeycomb Company of Texas, of which E. G. LeStourgeon is manager.

C. C. Miller's Memorial

The subscription for a scholarship to the memory of Dr. Miller is going very slowly. Of course, many will expect to send their donation this month, at the anniversary of Dr. Miller's birth, when he would have been 90 years old. Besides, we can hardly blame the American people, for being slow on a subscription of this kind, in view of the fact that so many millions are going to the starving people of Europe, China and Armenia. That is laudable. But now, friends, if you intend to do your part in this Miller memorial, **do it now.** If we don't get enough for a scholarship we may build a monument. But if Dr. Miller has ever done you any good through his advice, and he has done good to many, remember him, if it is ever so little.

John Burroughs

The death of John Burroughs, on his way home from California, on March 29, removes one of the greatest nature lovers, with keen powers of observation and a most pleasurable ability in descriptions. He was a bee-lover. His essays, in "Birds and Bees," giving "An Idyl of the Honey-Bee" and "Pastoral Bees," are delightful reading, though at times there are slight errors in his appreciations. But there are jewels, also. We read:

"I have a theory that when bees leave the hive, unless there is some special attraction in some other direction, they generally go against the wind. They would thus have the wind with them when they returned home heavily laden, and with these little navigators the difference is an important one. With a full cargo, a stiff head-wind is a great hindrance, but fresh and empty-handed they can face it with more ease. Virgil says bees bear gravel stones as ballast, but their only ballast is their honey bag. Hence, when I go bee-hunting, I prefer to get to windward of the woods in which the swarm is supposed to have taken refuge."

And, of course, the bees cannot smell the flowers, unless these are in the windward. So Burroughs was surely right.

A Good Move

The American Honey Producers' League is undertaking a number of things for the benefit of the craft. One of the latest is the appointment of a committee which will endeavor to arrange the conventions of the various associations in consecutive order. This is an arrangement very much to be desired by the speakers who make a practice of attending conventions, since they can attend more meetings with less travel and with great saving in expense. It will often make it possible for conventions to secure speakers who would otherwise be unable to attend. There are many beekeepers, also, who will find it easy to attend two or three conventions where they have only been attending one. Such a plan should serve to increase the attendance at the meetings as well as making it much easier to prepare the programs.

It Looks Easy

Beekeeping looks like a "snap" to those who know nothing about it. A newspaper clipping recently came to this office which paints a pleasing picture of the profits gathered for the farmer by the bees. According to this particular newspaper story, the only time which the farmer needs give them is the time necessary to hive the swarm. He can then move the bees after dark, to the place where they are to remain, and need not bother to remove the honey until late in the fall, when his other work is all done. It is stated that only a few minutes are necessary to do this, and almost any odd time will serve the purpose. This is about the idea of beekeeping entertained by the average man. It reminds us of one of Secor's poems which runs as follows:

"I am one of them happy beemans
Who don't have to work any more;
I sit all day in the apple tree shade
And smoke mine pipe by the door."

One very good turn that the colleges are doing for the industry is to educate the public to the fact that beekeeping is a man's size job, which requires a full day's work to make any profit.

Our Exchanges

Although the American Bee Journal is probably the most costly publication on bees, published each month, we are exchanging free, with every bee publication in the world, in any language, that desires the exchange. A number of publications that came to us either stopped temporarily or disappeared, since the beginning of the world war. These publications which resume will be welcome and the Journal will be sent them when we receive their magazine marked "Exchange."

Not All Dead Yet

There is a common saying that "Fools are not all dead yet." In proof that the saying is true one has only to read the current comment on beekeeping subjects appearing in the newspapers. It seems that no matter how fantastic a statement may be, the average newspaper reporter is always ready to pass it on as a gospel truth.

For some time past there has been a story going the rounds of the press of an immense cave somewhere in Texas that is occupied by hundreds of swarms of bees. These bees, according to the story, have been there for many years and have been storing up their honey until there is now available some millions of pounds. In fact, the latest clipping to come to our attention has increased the quantity from mere millions and now gives the figures in billions of pounds.

It is reported that the delegates to the recent Indianapolis meeting enjoyed a whole evening of fun at the expense of a gullible promoter who had secured an option on this mythical cave and who proposed to organize a stock company to secure and market the enormous store.

It now appears that some eastern people have taken the story so seriously that they have employed an engineer to visit Texas and locate the cave and ascertain whether the building of an immense packing plant there is feasible. At last accounts the engineer had arrived in Texas, but was having difficulty in finding the location of the cave.

Workers and Queens

"Whilst most bee books speak of the marvelous manner in which the workers can raise a queen from a worker egg, the reverse is actually the case, and the miracle performed thousands of times oftener, since the queen is bound to reproduce herself each time she lays a fertile egg, and the rearing of workers from queen eggs the more wonderful occurrence." (Gilbert Barratt, quoted in October-April Bee World.)

Why did we never see it in that light? Even Mr. Langstroth spoke of the wonderful change which the queen-cell and the better food produced, while it is really as Mr. Barratt says; for the wonder is that the bees be able to rear neuters instead of fully developed females in each worker cell.

Swarms

Most of us do not wish our bees to swarm naturally. Our apiary may be located among high trees, where a swarm is unpleasant to bring down. Or we may be away on business, with no one to watch the bees. We may not want any increase in the number of our colonies and, if we do, we prefer to make the selection ourselves of the hives that will furnish the increase.

If we have young queens in our hives, few drones, large brood-chambers, plenty of empty combs, or at least plenty of room in the supers, ample ventilation secured by raising the hive from the alighting board until the bees do not lie outside in clusters, and, last of all, good shade, either artificial or natural, we have our colonies in the best possible condition to avoid swarming. The amount of natural swarming will then be probably less than 10 per cent, and often less than 5 per cent, of the number of colonies, spring count.

But if our bees do swarm, let us enjoy the pleasure. If we have empty hives in readiness, so that they may be placed in a suitable spot immediately after the swarm has clustered, we may enjoy the sight of the most exciting of all bee pranks.

Did you ever watch a hive during the exit of the swarm? No matter how large the entrance, there does not seem to be enough room for all the bees that try to go at one time. If you open the hive during that exodus, you will see them fly out from every comb, just as if they were so many robbers frightened away after filling themselves. The "home feeling" is gone; their thought is on going, no matter where.

If you can catch the queen, as she emerges (and she does not always emerge among the first), you may make the hiving of the swarm a very short business. All you need to do is to put her in a cage, remove the old colony to another spot, with the cage containing the queen on the alighting board. In a little while, though the bees may have clustered, they will perceive that the queen is not with them and will return to the old spot. But the old colony may be too much deprived of bees by this method, and it is well to either replace it on its stand, putting the swarm in a new spot, or give it a quart or two of young bees from the swarm.

The hum of swarming bees is a delightful sound. Read what the great Huber wrote concerning it:

"Do you hear any discord in this numerous concert? This soft humming is, to my sense of hearing, composed only of accurate tones. This aerial music goes straight to my heart; I acknowledge that I never heard it indifferently; is it possible that what I find in it expressive, touching, melancholy and even solemn, comes only from myself or my imagination? I will not deny the natural exaltation which rises within me through this interesting event and this apparent agreement in will and sentiment in beings that are placed (by us it is true) almost at the foot of the scale.

"Are the people with imagination more or less happy than the others? If the pictures which they paint for themselves always come to life, they are surely to be envied, for, being masters of their palette, being always able to select their colors and assort them properly, their horizon is made up mainly of pleasant perspectives. They are accused, however, of sometimes painting too flattering images and to welcome with too much partiality air castles upon which wise and cool minds would never have stopped."

Huber holds that the humming of the bees in a swarm composes harmonics which form a perfect chord "to me the most ravishing of all, when it is performed by 15,000 or 20,000 bees, workers and drones."

In the issue of a swarm, there is not only a very harmonious sound; there is also a highly perfumed odor composed of the different scents of the honey, the pollen and the wax, all blended together in the natural odor of the little honeybee. There is no odor of the sting, if they are properly handled, for bees, at swarming, are always peaceable, since they are all filled with honey and are bent upon seeking a new home, where they will again begin their active life of work.

The Beeswax Market

From the Oil Paint and Drug Reporter, we glean some interesting statistics regarding the imports and exports of beeswax, together with prices in this country for the past four years. The imports have been as follows:

1917—2,858,190 pounds, worth $994,159.00.

1918—1,558,048 pounds, worth $584,194.00.

1919—2,383,901 pounds, worth $896,327.00.

1920—4,142,931 pounds, worth $1,418,023.00.

During this same time our exports were small in comparison to our imports, as the following figures will show:

1917—256,467 pounds, worth $95,751.00.

1918—165,382 pounds, worth $63,244.00

1919—210,046 pounds, worth $92,285.00.

1920—632,811 pounds, worth $294,592.00.

During the year 1919, the market price is given as 36 cents per pound, at the low point, and 45 cents at the highest. By the close of 1920, the price had fallen as low as 18 cents per pound, on the same markets. It will be seen that the foreign wax coming into American markets in 1920 was nearly three times the amount received in 1918 and the price had fallen to less than half that of the year 1919.

To Stop Robbing

Mr. Charles Boone Saunders, of Indiana, writes about a method of stopping robbing; he says:

"The best method I ever learned is to use half kerosene and half water, in a Mason jar with holes in the lid as in a pepper box, and sprinkle the colony with it that is being robbed. The robber bees soon leave it, but it will kill bees if you get too much on them. One should be careful and use it sparingly.

"Let those who have never tried it give it a trial."

All unpleasant smelling drugs are good, but they should be resorted to only when ordinary means fail.

HONEY PRODUCTION IN THE DADANT APIARIES

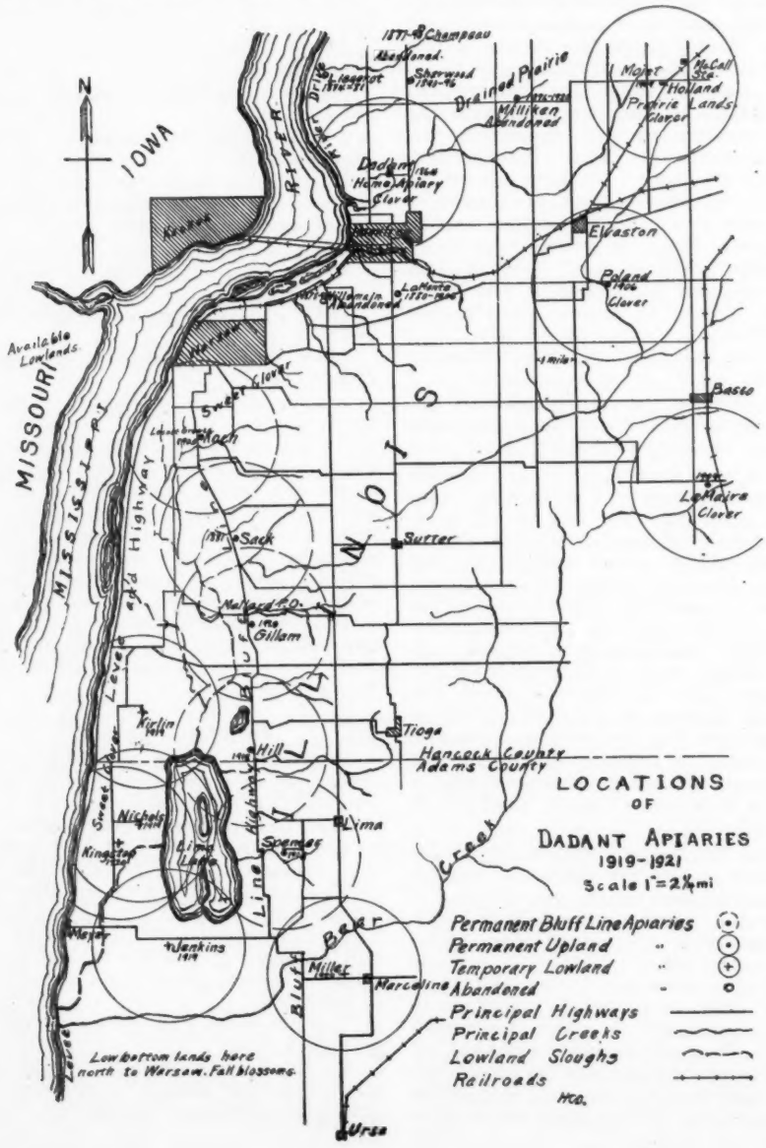
Showing the Results of Two Seasons During Adverse Conditions in the Central Mississippi Valley

By H. C. Dadant

FOR many years past the Dadant apiaries have not had the sole attention of one person. Yet on the average the apiaries pay well. The past two years were among the discouraging ones. 1919 was turned to good account by moving a large number, and 1920 paid out in spite of considerable expense and crop shortage caused by too much flood, followed by drought at nectar secretion time. The poorest season in years was tided over without loss, which helps materially to bring up the average. Crops like that produced in 1916, of 235 lbs. per colony on a spring count of 525 are worth building for.

Colony records were kept on the hives as usual. A daily record, as shown, can be written up in a minute of time before leaving the apiary, and is an accurate basis for figuring the season's expenditure as well as reliable notation for reference before the next trip is made to that apiary.

The Dadant home apiary is well located in hilly country among pastures producing white clover. Here, as at the outapiaries, a large crop of white clover honey is harvested one year and a fair crop two seasons out of every five, on the average. Fruit bloom in April and May, and locust in May, precede the white clover crop of June and July. Then comes some basswood the latter part of June, followed by buckbrush, horsemint and catnip in July, these latter preceding the fall crop of heartsease and Spanish needle, which usually lasts from August 10 to September 15. This fall crop may even continue until frost early in October. At the end of the season come, also, some asters, goldenrod and other fall blossoms. Our main crops, however, are white clover, June and July, and Spanish needle and heartsease, August and September. It is those dates for which we build up our colonies. Volunteer and cultivated sweet clover and an occasional field of alsike are good yielders and sometimes produce some surplus from June until September.



With a 1919 spring count of 530 colonies and the advance knowledge that there was fair prospect for a flow of fall honey on the Mississippi River bottom, located on an average of 25 to 30 miles from the five upland apiaries, an increase of almost 30 per cent was made during May and June by the aid of considerable feeding of sugar syrup. Most of these new colonies were built up to six-frame strength in advance of the moving.

The apiaries of Spencer, Hill, Sack, Koch and the new permanent location, Gillam, very seldom fail furnishing a fall crop from the river bottoms, their location being three to four miles apart along the bluff line of this territory. Many of these bottom land locations, along various rivers tributary to the Mississippi, as well as flat and undrained high prairie lands, are as good fields for nectar as the best upland districts are for clover, on the average. Favorable seasons for clover usually occur in this locality twice to three times in five years. One year in five a fair fall crop may be secured in the upland districts. It is conservative to say that during two years not more than ten to twenty-five colonies of bees, on an average, can be profitably kept in most drained upland districts. Therefore it is highly advisable to find temporary bee pastures in localities from 5 to 30 miles from the permanent apiary site.

By the chart, notice that the range for bees at Spencer apiary is somewhat restricted by being directly east of the heart of Lima Lake. This location may be abandoned soon for one farther south.

Ninety per cent of the colonies and supers comprising the five upland apiaries—totaling about 300—of the Dadant home, Poland, LeMaire, Milliken

APIARY WORK

Date 5-26-1919

Apiary Koch Trip HC&D Dodge

What taken

What done 8 Queens 3 Ex. R. 1 Clean Grid KQ. Cells, Rep'd Doubled 3 lower rows closely. Examined all

No. colonies 72 1 Hives sick Combs

Queens 2 Hives with fruit comb

Doeuses ready for swarms

Supers put on 65 for Koch

Feed on hand 4-5 gal cans

What taken away and where

What needed Hives + fruit in frames. Brood + part hive bodies Boards

Remarks Black locust over half gone. Plenty fresh honey in supers, some honey just starting

Signed HC Dadant No. hours 10

And C Swanson No. hours each 10

Daily record used in the Dadant apiaries.

and Holland were moved about July 20, 1919 by two motor trucks and placed in the midst of the waste land fields grown up in Spanish needle, heartsease and other fall blossoms. These locations, as shown, were Kirlin, Nichols and Jenkins. The map shows how well this lowland territory was covered by 700 colonies of bees in eight locations. As permanent outapiary locations are hardly practical in the lowlands, on account of bad roads during spring months, and the spring clover crop would be limited, the three temporary locations were thus established and placed three or four miles apart, in a line about parallel to the five permanent apiaries on the bluff. In this way, wedge-shaped territory measuring about four miles wide at the south end and one mile at the north end, seventeen miles long, was occupied. No doubt if this migration had not been done, heavy feeding to save these upland apiaries, during August, September and October, would have been necessary in order to carry the spring count of 544 colonies over for the next year. It is doubtful, too, whether a sufficient quantity of sugar or good honey could have been obtained to feed all the colonies. The result from the colonies comprising the 30 per cent increase was also gratifying. They built up well by October 1 with plenty of honey for the winter, and many of them produced as much as one to two supers of surplus. The crop resulting shows an average of 75 pounds per colony for a spring count of 544, or 60 pounds for a fall count of 700.

Because of the failure of the spring flow, some heavy feeding of sugar syrup was done, as the 6,000 pounds of sugar recorded testifies, same being used during the spring and summer months. Half was used to build up the 30 per cent colony increases made, while the other half was fed to carry the bees through the summer until the fall crop arrived. About 500 pounds of sugar was fed after the fall honey flow, to provide brood-chambers which contained a very large percentage of brood and a small quantity of honey.

There was but little annoyance or loss of bees from swarming. The swarming recorded is about 4 per cent in 1919 and 2 per cent in 1920. With a little closer attention during the height of the honey crop, the last ten days of August, swarming could have been reduced one-half in 1919. A shortage of supers for some of the stronger colonies caused a crowded condition, which must always be avoided ahead of the height of a honey flow. A few swarms came from colonies headed by old queens. The various factors well known to control and almost prevent swarming were practiced, and may be mentioned in the order of their importance:

1—Young queens.

2—Large brood-nests with combs built from full sheets of comb-foundation.

3—Plenty of extracting supers filled with drawn combs in shallow supers.

4—Plenty of ventilation and shade, including spacing of frames 1½ inches center to center.

5—No queen excluders.

6—Very few drones.

Although there was not sufficient honey flow at any of the apiaries in 1919 to carry the colonies along properly before August 1, there was not an entire lack of nectar. For instance, at the Dadant home apiary, where an increase of 50 colonies was made from a spring count of 59, there was a little steady honey flow from 16 acres of sweet clover, during July, which was sufficient to furnish about as much nectar as the quantity of sugar syrup fed. At the Hill apiary, there was a light flow of honey from various sources, after June 10, lasting until the fall crop, which began about August 1. At the Sack apiary there was one light flow during the last 10 days of May, which was only sufficient to help brood-rearing for about two weeks. Consequently, more feeding had to be done, there, before the fall flow started. At the Koch apiary, there was the usual ten days' flow from black locust during the last days of May. This necessitated the placing of many supers on hives and destroying some queen-cells in order to prevent swarming among colonies

Investment

	1919	1920
Honey houses and equipment (owned previous to 1916).	$1000.00	$1000.00
550 1-story hives, no bees, at $6.50	3575.00	3575.00
150 1-story hives, new, no bees at $9.75		1452.50
1375 supers at $1	1375.00	1375.00
375 supers, new, at $1.50		562.50
	$5950.00	$7965.00
550 colonies bees at $5.00	2750.00	
700 colonies bees at $5.00		3500.00
	$8700.00	$11465.00

Receipts

	1919	1920
41,800 lbs. amber fall honey at 18c	$7524.00	
462 lbs. beeswax at 40c	184.80	
156 colonies increased bees at $5.00	780.00	
13000 lbs. clover honey at 20c		2600.00
12000 lbs. amber fall honey at 15c		1800.00
275 lbs. beeswax at 35c		96.25
	$8488.80	$4496.25
Expenditures	4603.10	4361.16
Profit	$3885.70	$ 135.09

Expenditures

	1919		1920
Labor—			
Dadant, 704 hrs at $1	$ 704.00	133 hrs. at $1	$ 133.00
Help 3053 hrs. at 40c	1221.20	2325 hrs at 55c	1278.75
Mileage (without driver)—			
Ford, 3334 miles at 10c	333.40	530 miles at 11c	58.30
Dodge 1380 miles at 12½c	172.50	3464 miles at 14c	484.96
Trucks 1638 miles at 22½c	368.55	782 miles at 25c	195.50
Sugar—			
6000 lbs. at $9.85	591.00	6532 lbs. at 20c	1306.40
500 lbs at $12.51	62.55		
Queens—			
658 at 80c	526.40	131 at $1	131.00
Small equipment	50.00		50.00
Barrels used 1 year—			
76 at $1	76.00	45 at $1	45.00
Rentals—Cash	200.00		200.00
Decrease in Colonies—			
Bees only	none	16 colonies at $5	80.00
Depreciation on Investment—			
5 per cent on $5950.00	297.50	5 per cent on $7965.00	398.25
	$4603.10		$4361.16

headed by old queens. Later all this nectar was consumed, and a little feeding was done before the fall flow began. The apiaries at Milliken's and Holland's both experienced a little flow, from white clover, which was sufficient to carry them through the month of June. The remaining apiaries, Spencer, Poland and LeMaire, were heavily fed with sugar syrup, and most colonies in those apiaries were short of stores before June 1.

In beekeeping, perhaps as much or more than in any other occupation, the operator must know what to do and do it in time. Even the older, experienced beekeeper, cannot afford to slight his bees at a time when they need attention. An example of this occurred at our Sack apiary, during the middle of May, when 70 of the 81 colonies were found on the point of starvation. This shortage of food had gone to such an extent that not only had the queens ceased laying and no honey could be found in the hives, but the bees had actually killed all their drones and were uncapping sealed worker brood, as well as dragging out the larvæ. An experience of this kind, to amateurs, might easily be mistaken for a bad case of disease throughout an apiary. In spite of this setback, however, this apiary, upon being promptly fed, was carried for two weeks, until the honey flow from black locust came, the latter part of the same month. Eventually, this apiary did very well for the season, as the record testifies 10 barrels of nice fall honey harvested.

Annual migration, for honey crops, is not a common thing in the Mississippi Valley, but is being practiced with profit more and more in recent years. 1919 was our first on a large scale. To get full returns for the effort and expense, bees must reach the field in time to get the full benefit of crop yield at the temporary location.

When the spring of 1920 opened the prospects were about the same as the previous year. Considerable moisture, however, brought about a small flow of white clover, which eventually turned out to be 12,000 pounds, half of the year's crop. Too much moisture caused a late growth of the producing weeds of the lowlands and many of them did not mature before September. Added to this drawback, a drought set in at the time when nectar secretion should have been at its best, and in that way the fall crop for 1920 was cut in two.

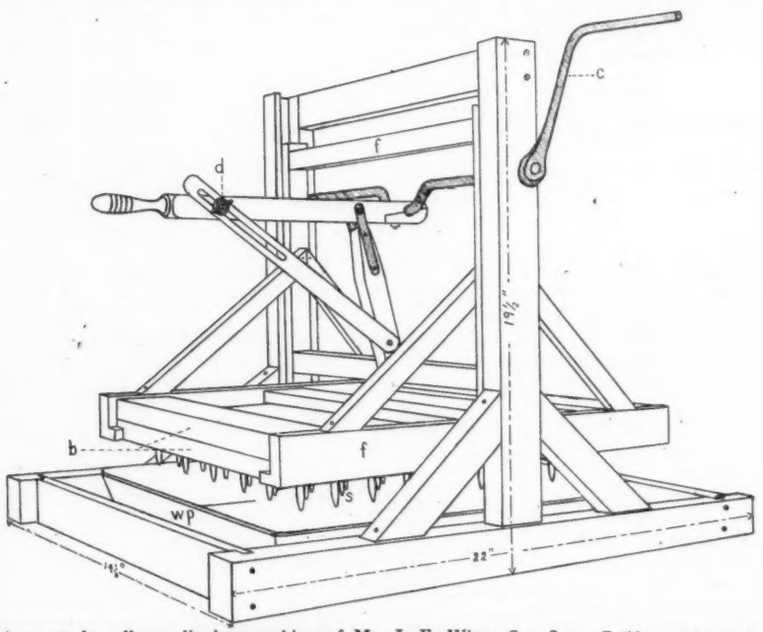
ECONOMY IN THE PRODUCTION OF QUEEN BEES

Part II.—Dry Grafting Into Artificial Wax Cups

By Geo. D. Shafer

At least as early as 1888, and perhaps before that, Doolittle had grafted very young worker larvæ directly into "perfectly dry queen cells," and had succeeded in having these accepted and finished on the combs of a colony preparing to swarm. When he began using artificial cups of wax, however, he followed the practice of placing a portion of fresh royal jelly (about the size of a BB shot, taken from any unsealed queen-cell) in the bottom of each cup, just before grafting. By smearing the bottoms of artificial cups with royal jelly in this way he found that a much larger proportion of them would be accepted. This practice of "wet grafting," as it may be called, is generally recommended by queen breeders and by books on beekeeping. Pratt, however, claimed that his "Swarthmore swarm-box" made it entirely unnecessary to place royal jelly in the cups before grafting, and he did not follow that practice. He saved time by grafting directly from the worker-cells into the dry artificial cell-cups, and the bees in his swarm-box were so eager to feed **young** larvæ that they accepted the little larvæ in the artificial cups and began feeding them royal jelly at once. "Dry grafting" in this manner is practiced by Wing in preparing bars of cell cups to be given his swarm-box hive, with the same excellent results. In "dry grafting" it must not be inferred that the little larvæ become at all dry themselves during the transfer, for such is not the case, if proper larvæ are taken. Huber established the fact that larvæ in worker cells are fed with royal jelly for about the first three days after they hatch. Doolittle says (Page 29, "Scientific Queen Rearing," sixth edition): "So far as I am able to judge, the larva in a worker cell is surrounded by three times the food it can use for the first thirty-six hours of its existence." This certainly seems to be true in the case of all worker larvæ **in colonies where there are plenty of well-fed nurse bees.** In the "dry grafting" referred to here, only such larvæ, about two days old, surrounded in the worker cells by an abundance of white royal jelly are used. In taking up these larvæ to transfer them to the artificial cell-cups, a goodly amount of the jelly is taken up and transferred with the larvæ to the cups. The little fellows can suffer in no way, therefore, since within a few minutes after the grafting process they are being fed again by the eager nurse bees in the swarm-box hive.

The artificial cell-cups of wax used by Wing are home-made by dipping—cups being obtained like those described by Doolittle. These are preferred, because the edges of the cups are thinner than those of the waxen cups made by compression—more like the edges of queen-cells under construction by the bees. In the long run, he believes, the thin-edged cells made by dipping yield a greater proportion of large well-finished queen-cells than the thicker edged, shallower compressed cups. Moreover, he has learned how to make the cups, by dipping on a large scale, just as cheaply as the compressed cups may be turned out. Forty-eight of the usual cell-sticks are nested in a board (9x14 inches) so that all the sticks may be dipped into water at the same time and then into a pan of melted wax, uniformly, five or six times. The machine shown in the accompanying figures makes it possible to raise and lower the nest of cell-sticks uniformly by simply turning the crank "c." Forty-eight cell-cups are thus dipped at one operation just as quickly as a single cup is turned out by twirling one stock in the manner first described by Mr. Doolittle. The cell-stick board "b" may be readily removed from the apparatus. In practice, three separate boards of cell-sticks are provided. While one set of cell-sticks is undergoing the preparatory soaking and cooling in



The home-made cell-cup dipping machine of Mr. J. E. Wing, San Jose, Calif., used for dipping 48 cell-cups at one operation. "b," cell-stick board; "s," cell-sticks; "w p," wax pan; "f," supporting frame for cell-stick board, "b," which is raised and lowered by turning "c." "d," slot device for adjusting the supporting frame "f" quickly, so that the cell-sticks will dip into the wax to the proper depth, as the work of dipping proceeds, and the melted wax is gradually used from the wax pan.

water, a second is being dipped by the machine, and from the sticks of the third board, which has just been removed from the machine, an attendant is removing the finished cell-cups. Thus, as fast as one board is ready to be removed, another is ready to be inserted, and the uniformly neat cell-cups are turned out at a rapid rate. These home-made cell-cups are fastened with a drop of melted wax upon thin, flat wooden cell-bases, instead of upon the well-known cylindrical wooden cell-cup bases. Each flat wooden base is about three-fourths of an inch square and one-sixteenth of an inch thick. The flat cell-bases are stuck, with wax, upon plain wooden cell-bars three-fourths of an inch wide, and the latter are supported in an ordinary Hoffman frame. In practice it is not found necessary to melt the wax each time in order to fasten these bases to the cell-bars. After they are once coated with beeswax, it is only necessary to press the little bases down firmly upon the bar to make them stick. This may be done most rapidly before the cell-cups are fastened to the bases. The advantages of these thin, flat cell-bases are that they may be cheaply made at home in large or small numbers, cheaply replaced if lost, and in introducing a ripe queen-cell into a colony or nucleus by pressing it against a comb, the thin edge of the flat base will mutilate the comb much less than is apt to be the case with the larger cylindrical cell-cup base.

The author has sometimes made use of the flat cell-cup bases in another way, which may be of interest to those acquainted with the "Alley plan" of obtaining queen-cells on strips of comb or with any similar plan of obtaining queen-cells on new comb. Alley placed a new comb of worker cells in the brood-nest of his breeding queen for about four days, until he obtained eggs and hatching larvæ in this comb. He then carefully brushed it free of bees, took it to a warm room, and with a thin, sharp, warm knife, so as not to bruise the comb, he cut it through every other parallel row of cells into long strips. The cells of the row on one side of each strip were now trimmed, or "cut down to within one-fourth inch of the midrib, and from this row of cells on each strip a row of queen-cells was obtained. Now in case of the Alley plan (or any similar plan) the queen-cells must necessarily be separated and carefully cut from the strip of comb before they can be distributed to different queenless colonies or nuclei, or to nursery cages. This distribution of queen-cells can be much more conveniently accomplished, of course, when the cells are built on separate bases; and it is possible to so modify the Alley plan (for example) as to have queen-cells started on the flat wooden bases without the necessity of grafting or using artificial queen-cell cups. Having prepared strips of "cut-down" comb by the Alley plan, carefully cut across these so as to divide them into many small pieces, each containing a single cut-down cell. Ten or twelve pieces (with larvæ of the same size) are now selected for each cell bar, and one of these little pieces of comb is fastened to each flat cell base on the bar with a drop of wax just above the melting temperature—the untrimmed side of the little piece of comb having been touched to the drop of wax in every case. By this means each cell base on the bar will present one "cut-down" cell containing its little larva surrounded with royal jelly. When cell bars prepared thus are suspended in a swarm-box hive in the usual way, the bees accept most of the larvæ in the "cut-down" cells and so start queen-cells on the separate cell bases. Grafting into artificial cell-cups is to be preferred; nevertheless the method just described is practical, and might be used to advantage by those who for any reason find grafting difficult.

California.

TOO MUCH HONEY FOR QUEEN-REARING

By Nathan Martin

I was interested in the article entitled "Too Much Honey," by John Protheroe (March number), and feel prompted to tell you some of my experience along similar lines. It is coming eight years, this spring, since I started beekeeping, with two colonies. I now have 48 colonies.

I was much interested in queen rearing, almost from the start, and feel much indebted to Mr. Doolittle. It appears there is still considerable controversy about this question. I feel convinced that it is far better to rear the queens than buy them of breeders. I have bought only a few, and always found that queens reared here were superior, in that their colonies were better for honey gathering. I run for extracted honey and have averaged over 100 pounds per colony for the past 3 years. I like to have good colonies requeen themselves, which they often do in second or third season. I have had colonies that stored over 150 pounds when queen was in third year, so I have no use for too frequent requeening. To avoid having the cells buried in comb, and comb honey at that, I provided a new frame, last season, in which the cell bars are near the bottom, and where the top part is screened. If this vacant space wasn't screened, comb would be built in it, or the sides of adjacent combs bulged in, greatly interfering with its manipulation.

The nearer the bottom they are, the less honey bees put there. This worked fine in height of honeyflow, when used on strong queen-right colonies in second super, and I got a nice lot of queens from colonies that stored between 150 and 200 pounds of honey.

In practice I find some things different from what noted authors claim. For instance: I have never found it necessary to feed cell-building colonies, but I don't attempt such work in a dearth of nectar. Early in the season, before supers are on, I am obliged to dequeen a colony if I want grafted cells built out, but not afterwards, when the honey season is good. When selecting strong colonies for cell building, I take the gentle ones, those that need no smoke for opening the hive; for I look at them quite often. My plan is to restrict swarming, but I like to make use of swarming queen-cells when they occur on valuable and gentle stocks. From this means I have propagated some of my best colonies.

You aver that a queen doesn't lay in a completed queen-cell (one made at beginning for that purpose). I think she does. Here is my proof: Take a strong colony having several incipient queen-cells built, but no brood in them. If you dequeen this stock, no cells will be completed on these foundations, but rather over worker cells. If you let this colony go ahead with its swarming program, you will find, at first, eggs in these previously built queen-cells, and later on, the fully developed peanut-shaped swarming cells, so different from those emergency cells.

Canada.

THE PRINCIPLES OF BREEDING APPLIED TO BEES

By Geo. A. Coleman

It is now a commonly accepted and well understood fact that the physical basis of all living things is the cell, a small portion of living matter usually enclosed in a thin membrane and containing a well defined center called the nucleus. The great majority of cells are concerned only in the building up and maintainance of body structures (tissues, organs, blood, etc.), but a few, called the germ cells, are set apart for the special function of reproduction. These are developed in the generative organs as eggs in the ovaries of the female and as sperm in the testes of the male.

The Beginning of a New Individual

The germ cells contain living material known as germ-plasm, which is composed of elements a part of which pass unchanged from generation to generation and carry the characteristics of the individual and of the race down the line of descent. As a result of mating there is a mingling of the germ plasm of two individuals carrying inherited characters of both. The queen mates but once, when she receives enough sperm from the drone to fertilize her eggs throughout her period of active production.

The characteristics of the new individual, resulting from the union of male and female germ cells is found to be determined by certain bodies in the nuclei of the cells known in scientific parlance as chromosomes (colored bodies), which are brought over in equal numbers from each parent with the exception of an odd body known as the X chromosome, which determines the sex of the new individual. All the chromosomes but the latter are in pairs, and their number varies with the kind of animal or plant, varying in the domestic animals from 40 to 48. The cells of the

queenbee have 32, while those of the drone have only 16.

Usually, before fertilization, the male and female germ cells pass through a preparatory process during which the number of chromosomes is reduced one-half and at fertilization, therefore, the union of the egg and sperm gives rise to a cell having the characteristic number of chromosomes, one-half coming from the mother and one-half from the father. The peculiar odd chromosome may be present in the fertile egg from only one parent, or from both parents, and it has been found that the pairing of this body from both parents always results in the new individual being a female. The male results from an egg bearing only one X chromosome.

In the honeybees, the process of parthenogenesis (virgin birth) gives an unusual result, because the unfertile egg of the queenbee is able to produce a new individual, but since it carries only one of the X bodies, from the mother, this individual is always a male. The sperm of the drone also always carries one X body and its union with the X body in the egg of the queen, therefore, always gives rise to a female. This easily explains the peculiar phenomenon so confusing to beekeepers but so valuable in breeding.

Mendelism

Scientific breeding has been developed from the investigations of Gregor Mendel, an Augustinian monk, who first published his results in 1865. Essentially, Mendelism is an attempt to explain heredity on a statistical basis, and its operation is best illustrated by some of Mendel's own experiments. By crossing tall and dwarf sweet peas he obtained hybrid plants, all of which were tall like the tall parent, but when the seeds from these tall hybrids were grown, three-fourths of the plants were tall, like the original tall variety, and one-fourth were dwarf, like the original dwarf variety. Continuing the experiments, Mendel found that these dwarf plants of the second generation bred true, producing only dwarf plants; but of the tall plants, one-third only bred true, the other two-thirds producing three-fourths tall hybrids and one-fourth dwarfs.

Mendel studied hybrids involving several pairs of contrasting characters and found that, in every case, one member of each pair of characters was expressed unchanged in the hybrids, whereas the other member of the pair became latent, and its presence could only be detected by growing the progeny of the hybrids. Those characters, which were expressed unchanged, Mendel termed dominant characters, while the latent ones he called recessive. In the above experiments, for example, tallness was dominant and dwarfness was recessive. The dominant character possesses a double significance, since either a uniform progeny of dominants can be secured or hybrid progeny in which one-fourth of the offspring displays the contrasted recessive character.

Since Mendel's time a vast number of experiments have been carried on, using animals like rabbits, guinea pigs, or white mice, which breed very rapidly, and insects like the fruit fly, which can be produced under artificial conditions with great rapidity. The principle of Mendelism has been found to hold good in all. Recent experiments by Wilmon Newell in the breeding of selected queens and the crossing of races show that the honeybee is no exception. He found that pure Italian queens, mated to Carniolan drones, produce only Italian drones, and Carniolan queens, mated to Italian drones, produce only Carniolan drones, which is strictly in accordance with Dzierzon's theory. However, the daughters of these hybrid queens produce both Carniolan and Italian drones, produce them in equal numbers and do not produce any other kind. The practical application of this is that the only test of an Italian queen's mating is found in the color of the drones produced by her daughters. The term "tested queen," therefore, as it is ordinarily used, is a misnomer, as far as pure mating is concerned.

A group of Italian railroad men receiving instruction in beekeeping from Inspector Joseph Montagano, of the Construction Office at Velletri, Province of Rome.

Hereditary Characters

Every breeding animal should be absolutely perfect physically, since it has been found that animals, physically defective at birth, are apt to transmit their defects to their offspring. It is therefore necessary that the breeding queen be absolutely perfect physically, and just as much attention should be given to producing and having, in the mating yard, only the most mature and perfect drones.

Fertility and Fecundity

Fertility is of next importance. The term signifies the ability of the mother to produce active, living young. Fecundity is used to designate the potential reproductive capacity of the individual. In the mother-bee it can be measured accurately and directly by keeping a record of the number of full frames of brood produced during the season. A few seasons' work of accurate record-keeping will show that there is a wide variation, even with the best selected stock. In general, it will also be found that queens of the greatest fecundity are those of the largest size and the most perfect physical development.

The factors which affect fecundity are varied. The environment of the queen undoubtedly has much to do with her egg-laying ability. For accurate results, therefore, the queen breeder must supply the proper equipment, especially an abundance of room in the brood-chamber, and plenty of food, in order that there may be no checking of egg production. Otherwise how can he expect the queen to demonstrate her ability? Get rid of all cramped brood-chambers, small hives and baby nuclei.

Inbreeding

Darwin concluded that all organic beings benefit from an occasional cross, and that the inevitable result of continued inbreeding is loss of size and a decrease in vigor and fertility. At times, also, there is an increased tendency towards malformations. Recent investigations, however, have shown that inbreeding, accompanied by selection for high productiveness, results in maintaining the fertility of the race. It was also found, though, that low fertility sometimes acts like a Mendelian recessive, appearing in alternate generations, and it would seem, even from these experiments, that inbreeding holds dangerous possibilities.

Prepotency

It was an early observation of animal breeders that some animals possess a superior power of impressing their offspring with their characteristics. This peculiar power is termed prepotency. The existence of prepotent animals cannot be denied, although by just what means their prepotency is expressed has not yet been determined. Bees are no exception, since we have instances of great fer-

tility in certain queenbees which have become of unusual value as breeders.

Inheritance of Disease

Disease is an abnormal process exhibited in some part of the body and dependent for its initial impetus upon some external cause. Obviously, if we accept such a definition as this, there cannot be such a thing as the inheritance of disease. It has been demonstrated, however, that certain conditions in the body which predispose it to disease are inherited. The fact that a disease may reappear in successive generations does not constitute inheritance, since successive generation may often be subjected to **the same conditions** of life which favor predisposition to the disease, and the disease will, therefore, appear as often as the proper external stimulus is applied.

Fortunately, it appears that in general, the normal state of health is the dominant condition and that predispositions are dependent for the most part upon the action of recessive factors. The most striking examples of heredity taints occur in the human race and it is a matter of grave concern that fully 30 per cent of the population of the earth should be burdened with some physical defect inherited from ancestry. The animal breeder does not propagate his defectives. He rigidly culls them out, and the few defectives which do occur from generation to generation are immediately condemned, as far as breeding purposes are concerned. We should follow this rule persistently, and with the greatest care, in queen breeding.

Immunity to Disease

As far as bees are concerned, immunity to disease is a matter of producing queens of such perfect physical development that they are able to produce practically one hundred per cent perfect workers which will give larvæ adequate attention and food, producing in them a high degree of resistance to disease.

Use of a Pedigree System

The only rational method of determining which individuals are best for breeders is one in which a careful record is kept of the ancestry for at least four generations, and of the behavior of the individual queen for at least two generations. It is not necessary to go back of the fourth generation, since in the fifth generation there would be thirty ancestors to record, and beyond this it would be an endless task with no practical benefit. The most important part of the record is the behavior of the individual breeding queen. In order that we may have such a pedigree system established, the author proposes the following, which has been in use in his own breeding yard for the past five years, and has been practical and of value

First—The selection of all breeding queens upon a basis of constitutional vigor and vitality, measured by performance in egg-laying and the length of breeding season, the number of full frames of worker brood, in a year, to be the test of fecundity.

Second—The performance of the workers as shown by their record in honey production.

Third—Selection of queens whose progeny have never shown a disposition to disease of any kind.

Fourth—The selection of drones for mating from queens which show as good a record as the breeding queens, and preferably from a different strain of bees.

Fifth—The use of a pedigree by which it will be possible for the breeder to tell the parentage, for four generations at least, of any breeding queen.

In the establishment of such a system, it is first necessary to discover the queens which have the quality desired, and the best way of doing this is by selection. The breeder should first secure tested queens from as large a number of proved strains as possible and from these queens, and their daughters, he may select for his own stock. The author has been using this system and the results have been surprising in many ways, disappointing in some, perhaps, but finally resulting in a few strains of Italians which have given a good account of themselves. From these strains, the author proposes to select tested queens and breeders, and to give them as wide a distribution as possible, in order that they may be tried out under varied conditions. Record cards will be furnished with each queen, for a record of her performance, and this card is to be returned so that we may have a check on our breeding stock. We will thus be able to eliminate queens which are not strictly up to standard.

California.

CONTRADICTIONS

By Jess Dalton

A common method of requeening is to kill the old queen and give a ripe cell. I have never had uniform success by this method, often losing three-fourths of the cells introduced. No matter whether I waited two minutes or two days before giving the cells. Last summer in raising queens and making increase, I often had a surplus of cells. To use these cells I often took three frames of brood and placed them in a nucleus box, inserted a cell between them, shook a few pounds of bees into it, closed the box and placed on a stand. I lost practically none of these cells.

I have practiced running virgin queens in with smoke for years with fair success. Last summer I had 18 small colonies to requeen. Just 18 virgin queens were saved, and choosing favorable conditions I smoked them in. I had grown so confident of success that no provision was made for failure. I never had such a failure, nor have I any clue as to the cause. I lost 17 of the 18.

I have had two queens in one hive time and again under the supersedure impulse. I have also had a few mate from an upper story over an excluder accidentally, with a laying queen below. Although I have tried to repeat the same condition, I have never been successful—not once.

To introduce a laying queen I placed her with the cage open between two frames of emerging brood, from which all bees had been brushed. These frames are placed in a super with a newspaper between it and the colony below. This greatly reduces the loss.

There are a lot of things very hard to account for. There are more contradictions in the bee business than in any other with which I am acquainted.

Louisiana.

CARE OF MAILED QUEENS

It often happens that a beekeeper receives a few queens from the breeder and cannot use them at once. Perhaps the weather is bad and he is unable to work in his apiary, or he fails to find promptly the old queens which he desires to replace. In order to preserve, in the best possible shape, the queens which have been received, they should be kept in a dark, quiet place, of even temperature. If there are several queens and the beekeeper uses only a few at a time, each cage should be looked over carefully and the one which appears to be the least lively should be used first. Very often the cages contain a dead bee or two, and these should by all means be used as promptly as possible.

Queens, if packed properly with the right kind of sugar candy, live several days in quiet confinement. The quieter they are kept, the less they are handled, the longer they will live; if handled in daylight they attempt to get out of the cage, and worry.

Sometimes the candy does not have sufficient moisture, and it is well to put a drop or two of water on each cage. It is not because the bees need water, as they can go a long time without it, but if the candy is hard, it helps them to soften it.

Keeping caged queens right over brood-combs in a queenright or queenless colony is practiced also, but one must be sure that the bees of the hive cannot get to the candy of the cage. The bees of a hive will feed any number of queens, in cages, even if they have one of their own, but they will allow the caged workers to starve.

In any case, queens should be used as promptly as possible after being received, and instructions for introducing must be very carefully followed. If introduced during a dearth of honey, late in the evening is the best time to put the queen in. The old queen may be killed at any time during the day, or she may be caged and the new queen introduced in her place after everything is settled and robbers have ceased to roam about. The queen is then introduced with much less danger of the bees taking a dislike to her than if she is put in while the colony is still excited.

As a matter of course, if queens die while held in this way, the shipper is not responsible. Breeders guarantee safe arrival and should not be

liable for any delays after arrival. But many a queen could be saved that is lost because of careless handling. I have seen queens in cages handed around for hours among the children of the family out of curiosity and as if they were a thing to play with. They require great care, their future fertility depending upon the attention given them, and that is what prompts this statement.

BEES WHICH WOULD NOT ACCEPT A QUEEN

By Rev. Albert R. Rue

In your January issue I read with interest the article by Eugene Holloway entitled "Colony of Bees that Would Not Accept a Queen." It is of much interest to me because of some unique experiences I had this summer along the same line. In June I ordered a dozen pure Italian queens from a well-known breeder of queens in the South. I introduced them according to directions, as I had often done before. Most of the colonies accepted the queens as soon as they were gnawed out of the cages. Two gave me difficulty.

One colony had a young queen in the spring, superseding a pure Italian that I had introduced the year before. I did not like her, and so killed her, immediately introducing the new queen from the South. After about a week I opened the hive, as I did the others. I found most of the queens laying, but there was no sign of a queen in this hive. I was pretty sure they had killed her, because they had a fine array of queen-cells started. I took all the cells out and sent for another queen in the Southland. She arrived in six days. I introduced her in the same way. About ten days later I went into the hive to see what had happened. I found not a sign of a queen anywhere. I then sent South for another. In about a week she arrived. I went into the hive and looked it through very carefully to be sure they had not slipped one over on me, and hatched a queen for themselves. There was no sign of anything to indicate a living queen. Then I introduced the third queen in the same way. After a week I looked into the hive and found no queen. I waited another week and looked again, thinking that maybe the third queen was there, but was delayed in laying because of the long trip from the South. But there was no queen in the hive.

Then I was just wondering what to do next. I felt I had spent enough money and time on that swarm. I planned to let them raise one of their own. I took a frame of fresh eggs from a hive that two months ago accepted their queen, and gave it to this swarm. They immediately started queen-cells, and in due time hatched out a fine queen. She was certainly a beauty. I think I never saw a finer young queen the second day after she had emerged. It was getting late, and there were few, if any, drones in my apiary besides those in the hive with the young queen. She was fertilized during the week following, and had time before going into winter quarters to lay just a few eggs on two different frames.

The other of the two colonies worked differently. They had a jet black queen, being a wild swarm I found on a bush. I killed her and introduced one of the twelve queens, the same as all the others. While she remained in the cage waiting for the bees in the hive to release her, the bees had built some queen-cells on one of the outer frames. I saw them there when taking the center frames out a week later to see if the bees had accepted the new queen. I found her on the center frames and laying. It was at this time I saw the small quen-cells on the side frames. Three weeks later I opened the hive to take a little look at things. I saw a few fine Italian bees crawling about, just as baby bees. There was some other capped brood emerging and ready to emerge. Then there seemed to be nothing else but fresh eggs. I knew something was wrong, and on further investigation I found the pure Italian queen was gone, and they had raised a young queen, black as black could be, from the eggs of the former queen in the hive.

Those two colonies are in winter quarters, both with queens of their own choice, and not those that I wanted them to have.

Iowa.

Part of the apiary of O. E. Timm, Secretary of the Nebraska Honey Producers' Association. This yard averaged 75 pounds per colony of surplus.

DIFFICULT QUEEN INTRODUCTION

By W. E. Joor

After reading the experience of Mr. Eugene Holloway in the January Journal, and also the editor's answer, it has occurred to me that a little further comment might be of interest.

Of course the editor is right that the best time to introduce a queen is immediately after the removal of the old queen, but sometimes we have to introduce her to a colony that has been queenless some time.

I had a colony at one time that refused everything I offered them. They were blacks that I was trying to Italianize. It was getting late in the season and I had about concluded to break them up. However, I had a queen (fine, pure-blooded, but old) that had been superseded several times successively, having been switched several times to other hives while being superseded. She appeared very feeble and I despaired of her living more than a week or two. I opened the black hive without smoke and dripped her on the frames and put back the cover. Three days later she was laying "to beat the band," and brought the colony safely through the winter. I secured several good queens from her the next spring before she was finally superseded.

Another case: A colony swarmed and lost its virgin and had developed laying workers. I had been sick, so I could not get to them before this condition developed.

I also had a colony with a 2-year-old queen that was not holding her end up. I took her out and in a very careless, hurried way, smoked her into the laying worker colony, which was in a leaky hive, all of which was against probable success. In due time there was plenty of capped worker brood.

Now why? Other experiences support my explanation, which suggests the remedy for a colony long without a queen.

A queen that is old or apparently failing, or even feeble from starvation, will not be attacked by bees, (sometimes in a queen-right colony, until she has recovered.) Therefore, introduce to the long queenless hive an old or feeble queen, by either the smoke or starvation methods. You do not value the colony much, for the bees are generally old, and you do not value the queen much, because she also is old and perhaps never was

much good. Therefore the risk is small. By old age or starvation (till the queen is nearly dead) or the smoke method, they will generally be accepted. Never use a cage method under such circumstances, unless you keep the queen confined nearly a week, making sure no young queen or cells are developed, and then, generally, you are likely to fail.

When your old worthless queen is at work and thoroughly at home, then as the colony is queenright, replace her with the queen you want in the hive, by any method that you normally succeed with.

Another oversight, I think, by Mr. Holloway, is given in his article. Two virgins hatched on two different occasions. Why was this permitted? Only one cell should have been allowed to emerge.

However, these long queenless colonies are generally not worth much anyway.

Texas.

WHY IS A DRONE?

By Arthur C. Miller

Search me, I don't know; but I do know they are strange fellows of many peculiarities. Their coming, staying and going is as the wind which bloweth where it listeth. One year they appear weeks ahead of the usual time in almost all of the colonies, and perhaps in mid-season scarcely one can be found. Again some fall, as in this one, the workers start early to drive forth the drones, and then suddenly the drive ceases and then drone-brood in all stages appears in the hives. Also this year much superseding has been observed as late as the first of October. Why are drones allowed in solid ranks to cover outlying sealed brood? I venture to say they gathered there to keep themselves warm and the workers withdrew to the inner recesses. And why did the workers desert the outlying brood and leave it to the care of the drones?

Why are colonies with an excess of drones more apt to swarm than are those with few drones? What have the big, lumbering, lazy fellows to do with the swarm impulse, anyway?

If odor of a colony is carried by a bee and governs its reception by an alien colony, then why are drones permitted to come and go at will into any colony they chance upon? Surely they did not shed their home odor.

Now drones do possess a sex odor and when they are abundant in a hive their presence is easily detected by a smell at the entrance if the apiarist has a keen sense of smell. Some persons have an exceptionally keen sense of smell and can develop and train it, and make it useful in bee culture, even if it is oft an annoyance to its possessor when compelled to enter a crowded conveyance.

Can we, by a more complete knowledge of drones, their presence, abundance, habits, retention and expulsion, judge of colony, weather and crop conditions?

Surely there is much yet to be learned about the burly, noisy, hungry drone.

Rhode Island.

BEE FEED

By A. F. Bonney

During the past few years the price of cane sugar was so high, and it was so difficult to get, that I fed honey, both for winter stores and brood rearing, and am now glad that it happened, for there is no question in my mind that honey, the natural food of the bees, is the best thing to give them. Of course we know they will live when given sugar syrup, just as a child will exist on a makeshift diet, but as we know the child will not improve, either physically or mentally, we may assume the bees will not. They will lack something.

At a time in the past I secured a sanmple of the "invert sugar," largely advertised as a winter feed for bees. An examination of it led me to think it was not made of cane sugar. While investigating this I had been trying to invert cane sugar without using an acid. I knew that a syrup made by percolation would not crystallize in months, but as I could not figure out any chemical change, I finally gave up and wrote to Park, Davis & Co., who turned my letter over to Mr. J. M. Francis, their head chemist, as I expected them to do. I wish to call attention to his remarks, that "the invert sugar which you refer to as being put on the market is probably not made from cane sugar . . . . and: "I should be very wary of feeding those bees before I had demonstrated by practical experience that it would not cause disease during the winter months."

The Francis letter follows:

"Invert sugar can be prepared, and in fact is prepared, from cane sugar by heating in the presence of a little dilute acid.

"There is absolutely no reason to assume that invert sugar would be formed from cane sugar by age or exposure to the oxygen of the air.

"Theoretically, cane sugar syrup, if slightly acidulated might produce a trace of invert sugar on long standing at comparatively warm temperature. One could hardly expect, however, that there would be any appreciable amount produced in this way.

"I am rather inclined to believe, therefore, that if you could learn the true history of the sample of syrup which you found not to show any tendency to crystallization, you would find that it originally had been invert by heating after the addition of a little citric or tartaric acid in preparing it for bee feed.

"The invert sugar which you refer to as being put on the market is probably not made from cane sugar at all, but is undoubtedly prepared by a chemical process from starch or some other very much cheaper material. In other words, this commercial invert sugar is very likely to rank pretty close to the artificial dextrose or glucose which is now prepared in enormous quantities and procured at a relatively cheap price. I should be very wary of feeding these to bees before I had demonstrated by practical experience that it would not cause disease during the winter season."

HONEY BUTTER

By Allen Latham

One of the greatest drawbacks to succeessful marketing of extracted honey is its tendency, indeed almost certainty, to candy. I find people in general very suspicious of candied honey, and that much argument and considerable skill are required to convince the average person that granulated honey is pure. Even when convinced, they are convinced against their will, and, I fear, "are of the same opinion still." A very determined campaign of education is vitally necessary, and this article is intended as a gun to help in this campaign.

One of the strongest arguments that can be offered is that arising from the injury done to honey through heat. I find that people will listen when I tell them that unless honey is heated and kept hot for a long time before it is bottled it is very likely to granulate. As granulation in the glass jars hurts the sale of the honey, the bottler is likely, in his efforts to prevent this granulation, to carry the heating so far that he seriously injures it, as he causes the loss of the aroma and flavor, for these are volatile oils and heat drives them out of the honey. The heating also causes the loss of vitamins, those mysterious somethings which are apparently so very essential to our health and well-being.

Then one can follow up this argument by saying that honey hardened into a solid mass is very edible as soon as one gets over his suspicions that it is not pure honey. This hard honey carries all the good points of fresh, liquid honey, except that it is not a liquid. What of that? Use it like butter. Spread it on bread and biscuits. Use it like real butter, or like peanut butter.

When this point is reached a counter argument is advanced. "But I don't like it, it feels as if I had some sand on my tongue." Now, how are we going to meet that argument? It is real. It is no phantom of the imagination. One cannot pooh-pooh it away.

A few years ago a well-known beekeeper of another State presented me with a jar of candied honey. He told me that he sold most of his honey in that form. Well, if his customers ate it in that form I think that they must have been very indifferent to what they put into their mouths. That honey was granulated very coarsely, with almost nothing between the granules. The grains were so coarse and hard that they dissolved very slowly, so that the flavor and sweetness were almost completely camouflaged. I can frankly say that if that were the only form in which honey

were served to me, I should go without eating honey.

It seems quite an obvious thing that, if we are to get the public to eat candied honey, we must serve it to them in a form which is palatable to the average person. There are some people who do not differentiate in such matters, but this is not true of the majority. We must serve the majority. Consider our present day confections. Is there one form of confection more universally popular than the chocolate cream? Unless one dislikes chocolate, there is scarcely a person who does not love a chocolate cream. The reason is simple. The smooth, velvety interior of the chocolate drop melts down upon the tongue in a most satisfying manner. It does not separate into a lot of granules to suggest sand to the tongue, as does coarsely granulated honey.

You see the lesson taught. We must make the candied honey take the consistency of the fondant of the confection. Once let the public into the secret of honey candied to the velvety smoothness of a high-grade chocolate cream, and our campaign is won.

To turn the trick is the next thing. Can we control the candying of our honey? Can we, at will, make it turn out smooth rather than coarsely grained? I wish that I could surely answer yes to this, but fear that some difficulties lie here, which only time and study can possibly remove, if at all. Some honeys will not candy at all, other honeys will candy very quickly; some tend to candy in coarse grains while others take a fine texture when granulation occurs. Two things, however, help greatly in producing a fine grained honey. These two things are density and agitation.

No honey which is extracted while insufficiently ripened will take a good grain when candied. We have herein another sound reason for extracting honey only after it is well ripened. Green honey is one of the worst enemies of the extracted-honey producer. Well ripened honey, if it will candy at all, can readily be made to take a smooth, velvety consistency upon granulation.

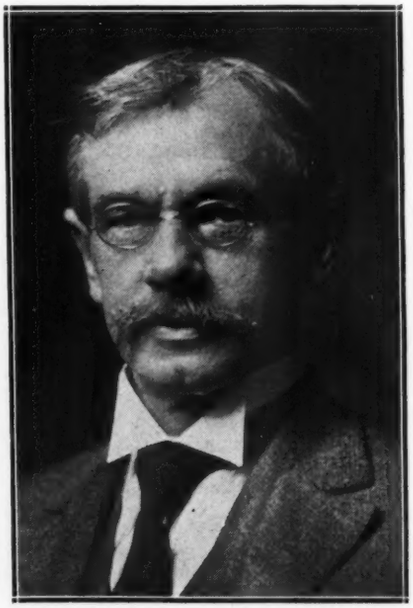
I have for some years sold candied honey as honey butter. I never have made a special matter of selling my honey this way, for the simple reason that some seasons I cannot get my honey to granulate. My main crop is from sumac, and this variety of honey will sometimes not granulate for years. It will get gummy, but will not grain. But if clover yields, and if I get some fall honey, I can blend these three and get an exceedingly fine article. The conditions this past season were favorable, the product being about 40 per cent clover, 50 per cent sumac and 10 per cent goldenrod. I might say here that the goldenrod honey in my locality is the same color as clover honey. Upon the arrival of cold weather a blend of these three honeys can be made to take the form of butter in a few days. Daily agitation is desirable. The honeys are put into a barrel and the contents stirred a little every day. Much stirring is not essential, simply a disturbance of the centers of crystallization.

I wished to make a specialty of my honey butter this winter and prepared about a ton. I filled nearly 2,000 pound cartons of the waxed variety with the butter when it was nearly ready to become hard. My daughter is an artist, and she prepared for me a carton or poster, and some lettered borders for a window display. A photograph of this window display is seen on the front cover of this magazine. Coincident with starting this window display in one of the central grocery stores of Norwich, I put several little advertisements in the morning paper. The day before these advertisements appeared I went about to all the stores which might handle the goods, grocery stores, drug stores, delicatessen stores, etc., and offered to place the honey in the stores at my risk. I placed the honey in about 22 stores.

The sales exceeded expectations. I had to renew the stock in some of the stores early the following week. The sales were not transient, either, but have kept right up. My stock is nearly exhausted. A large number of people have become acquainted with honey in this form, and have fallen in love with it. "Simply delicious," "Mighty good," and similar expressions, are very common. I clearly foresee that another season will bring a great demand for honey in this form.

We all recognize the desirability of disposing of our extracted honey in the candied state. I wish this article to be an entering wedge to lift extracted honey to a higher plane. We must see to it that our product meets the demands of the people of keen tastes, and sensitive palates. Coarse, sandy honey will never become popular, whereas the finely grained product speaks for itself and creates popularity unaided.

Connecticut.



Allen Latham, of Connecticut:

A TRIP THROUGH SPAIN

Our readers are already acquainted with Mr. Baldensperger. But it is as well to remind them that this eminent apiarist was born in Alsace, lived for a number of years in the United States, then went to Palestine, where he married an American girl and lived for many years. His home is now on the Riviera, at Nice. He has traveled a great deal in Asia and Africa and is herewith giving an account of a trip taken from France, through Spain, to Algeria. Mr. Baldensperger has kept bees in all sorts of ways, in different countries.

Oran, Algeria, March 1, 1921.

Dear Mr. Dadant: I have just crossed over from Spain and have had a look at Spanish beekeeping; I don't mean the few establishments of movable-frame apiaries which are kept in the province of Barcelona and near Madrid; for it was too cold there in February to look in the hives. But I rushed to the South, Cordoba, Sevilla, Granada, Malaga. Granada mostly attracted my attention, its present and its past. The snowy peaks of the Sierra Nevada did not allow the bees to be out, even on the sunny declivities of the pomegranate-split-open town of Granada.

I have great admiration for the Arabs of Spain in the Middle Ages. Their teachings were so thorough that, although four centuries have passed since the expulsion of the last of their kings, the traces of their culture and agriculture are still visible everywhere. Beautiful country and indifferent administration! What fine olive groves and palm plantations, pomegranate orchards and oranges for miles and miles, about Murcia especially, and all with the Arabic canalization work!

Says Chateaubriand: Boabdil, or Abu-Abdallah, was the last of the Moorish kings, and as he was driven out of the city, he could only sigh: "Oh! Granada!" He was compelled to leave it while America was being discovered, in 1492.

As I stepped into the magnificent Lion's Court, with the marble columns, I remarked to the director that the cell-work resembled the combs of bees. When he found that I was interested in bees, he showed me a swarm of bees which has been living in the Royal Palace for ages. No doubt the ancestors of those bees had gathered honey in the marvelous gardens of the Eldorado of the royal families, working on the highly-scented myrtle bushes still kept in the Alhambra, the grandest of all Arab architectural wonders. The bees did not worry about Moors or Spaniards—they went on with their work, preparing for swarming. And perhaps some day they will settle in the palace of Charles V, now wholly ruined, for they care naught for political changes, and they sip the sweets from the blooming almond trees and leave trouble to man.

The eucalyptus plantations seem to have been imported, but the miles of native cactus hedges (**Opuntia vulgaris**) yield a good crop some time in

May. From now till then, the bees will indulge in the rosemary flowers, which abound in all Spain.

The beauty of the Alhambra, the red building where Aisha, the mother of the king, lived, can hardly be appreciated by the present generation. Up in the garden were the apiaries which furnished the exquisite honey of rosemary. Moslems never drink any fermented liquors, but "pure honey, given directly from Allah" to wise people, as the Coran says in its 3rd chapter, was largely used at Court.

The Moorish-Spaniards thought so much of their bees and of their honey, without which they could not imagine a delicate dish, than on their expeditions to the newly-discovered Continent of America, they carried bees along in their caravels. So the ancestors of the bees of the United States and West Indies were brought from Spain, and it was through the ports of Cartagena and Malaga that they were carried through their long journey, by sail. The Moors and Neo-Spaniards must have been great experts, to carry bees with them at a time when neither wire-cloth nor anything equivalent to it was known, to close up the hives.

In Northern Spain, progress is much slower than in the South, on account of the commerce of the latter with sea-faring nations. The old Islamitic or Arabian hives are still in use all through Navarre and the Basque countries. In the South, their colonies are either in jars or in alfa-wicker baskets, set upright, the European fashion. The Moorish, or rather the Oriental fashion, was to keep the hives in horizontal position, 10 inches in height, by about 32 inches in length. I have met with these hives all over Cyprus, Palestine and Egypt, through North Africa and some parts of Spain. This fashion is Islamitic, as the bees were and are considered sacred, and honey was to be taken away only from the end, using a little smoke to drive away the bees, but not destroying them with sulphur, which is the Northern fashion. Although the Spaniards are now Christian, in the sense of keeping Sunday instead of Friday, which is the sacred day of Islam, they have inherited the Moslem respect for apiculture and agriculture in general. The names of many towns and villages, and especially of rivers, are of Arab origin, and they have the flat-roofed houses and cactus hedges around the villages. They draw water from the wells with the Arabian wheel.

The orange gardens along the plain of the Guadamar give plenty of bee-fodder in April, when the trees are white with the strongly scented flowers of the Hesperides trees.

The South Spaniards distinguish two kinds of bees: the smaller ones are commonly called "accarrago billadas"; they are very active and gather pollen and honey much faster than the larger kind; they are perhaps called after an Arab term "El Karagoz," which means "circus player," on account of their quick ways. They have a pretty orange-yellow band on the first ring of the abdomen, but so small is it that it is hardly visible. They are quite aggressive.

I stopped at a village called "Muchemiel," and thought that its name must be derived from the French "Mouche a miel," or "honey fly." They laughed at my suggestion, although their word for honey is "la miel," feminine; while in French it is "le miel," masculine. But I obtained what I wanted; I saw their larger bees, which are of the same size as the Southern French bee, but won't gather honey so fast as the "accaragos." They take honey from them by smoking them with a roll of cloth made of sack or burlap, lighted on the end. In the summer they look for queen-cells, and if they find any, they cut out the part of the comb upon which they hang and insert it in a new hive or "colmena," which is placed on the spot occupied by the old stock. Thus Rodriguez, the owner of the apiary visited, told me he managed his bees, for he had "no time to run after swarms." But he believed that they had a "king" to lead them out at swarming time, but at other times the king reigns in tranquility."

They melt their honey combs by sun heat, and afterwards sell the wax to "wax workers."

Wax is used for purposes which are peculiar to that country. In a church near Alicante is kept the authentic veil with which St. Veronica wiped the face of Christ as he was taken to Calvary. The Church is therefore called "Santa Fax," Holy Face. Ailing people come there to pray for a cure and, when their prayers are granted, they donate to the church a wax representation of the part of limb or of body which has been cured. This is made of pure beeswax; a hand, a limb, a face, etc. So beeswax brings a good price for this purpose, especially as wax candles are also offered at the same time, on account of their sweet odor when burning.

"The bees," said Rodriguez, "are better chemists than men; they gather the remedies for all diseases, in all kinds of flowers and offer them to human beings."

On the feathery palm trees at Elche, how many tons of sweets are gathered, by our good little friends, who wisely bring home the wonderful drug, liked by children and by grown people as well!

I am now gleaning information among the Algerians and may go among Saharian bees. If so, I will let you hear. But I must hurry, for my own bees will soon claim me, north of the blue Mediterranean.

Ph. J. Baldensperger.

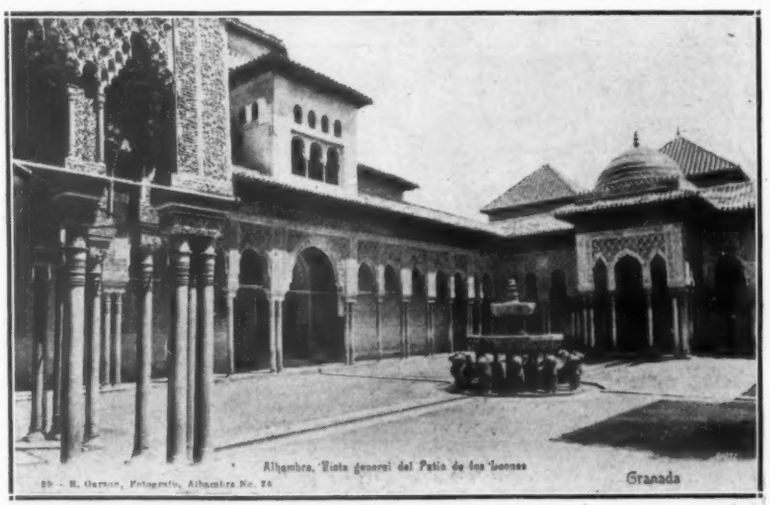
PRONUNCIATION

By Arthur C. Miller

Don't shy. This is a bee article, as you will find out if you will read it, and perchance it may help you.

Once upon a time, there was a good and learned man who was so exercised by the mixture of terms applied to bee culture and the confusion and loss which arose therefrom, that he compiled a dictionary expressly for beekeepers and for those of you who never knew it—and the appearances are that few have seen it and fewer own it, let me call your attention to the Dictionary of Apiculture by Dr. John Phin, and while I am about it, I will append a few additions and comments caused by more recent occurrences.

A dictionary, as you should know, contains not only a list of the words and their meaning, but also their pronunciations; but to prove that most of you don't know, just try to get the rank and file of the boys to pronounce and define "Nuclei." First they will call it nuclee. nucle, nuclay and if they want to refer to a flock of them they herd them by calling them nuclees, nucleusses, and as many more calls as you will find in a flock of blue jays. And you will find many of the boys will pronounce it by saying "a small colony." By the way, what is a colony? Our good English cousins pronounce it a Stock, but we pronounce it all the way from Colony to Nucleus, Swarm, Stock, Hive, Skep, Gum, and if we have been floored by disease we wind up by



The Alhambra, Granada, Spain. There is a swarm of bees at the angle of the building beyond the fountain.

pronouncing it a delusion and a snare. We mix up the container with the contents, just as we did in the old "wet days" when we tried to see the inside of too many containers.

The mixed terms for a bunch of bees is no worse than the mixed dimensions of supplies which the makers blandly pronounce Standard.

And that reminds me of my friend Brown, of Spiral Springs, Ill. Brown pronounces our supplies a jumble, says trying to successfully assemble a lot of supplies from several makers is about as pleasurable as trying to replace broken parts of your Rolls-Royce from junk scraps of a Tin Lizzie. Brown is a chap you should know. He is a real genius as a bee crank. Got more than enthusiastic about bees and plunged into outyards. Used to be seen at all hours toiling from home, laden with all the bee supplies he could stagger under. Pronounced it fun until Mrs. B. began to figure costs, and then became quite dumb and seemed to lose his enthusiasm for lugging things back and forth, so gathered together ten shekels of silver and bought a white horse. The owner pronounced it several ways, a bargain, kind, gentle, a little old but still useful, and sure to stand without hitching. That last was its strong point, or four of them, for not one of its four legs would it budge when it was so inclined or declined; in another word ,it was pronounced "balky." Brown knew that, but he thought he might say something to move him. So after acquiring the aforesaid white horse and not knowing of any red-haired maid to go with it, also being more or less dubious as to how Mrs. Brown would pronounce such an addition to the assembly, he proceeded to lace some hairs of red copper wire into the breeching of the harness for the white horse, doing it secretly and surreptitiously. Also, he connected those red copper wires with the reins of said harness.

From some source, the origin of which it were not wise for us to inquire, Brown acquired a wagon of unknown antiquity, and to this he affixed the white horse, and in a secluded and hidden part of the wagon he put a dry battery and tied it to the red copper hairs. Next he loaded the wagon with the standard supplies, pronounced all complete, bade Mrs. Brown a fond farewell, headed the outfit for the country via the neighborhood of the seller of the white horse and started. After standing longer than he liked, while Brown was doing the loading, the white horse **started** well, went a little way and paused. Brown pronounced some persuasive words, but the white horse seemed not to know the language. My secret opinion is that Brown's language had been corrupted by contact with bee literature; anyway he pronounced several different things, then pushed on the reins with their red hairs, stepped on the connection to the storage battery, and instantly the white horse went away from there. He shot by his former owner, nearly going over him. What the said former owner pronounced, Brown failed to hear, but the goods were widely and thoroughly distributed over Cook County, Illinois. Brown is still undecided whether to pronounce this trip a success or not, for some of the supplies are still missing and he does not know whether those are the pieces which fitted or not. But from that day on the white horse never failed to go when Brown or anyone else pronounced the right word, and in due time Brown sold him for many times ten shekels of silver, so that Mrs. Brown, after persuading Brown to part with a goodly part of the silver, joined him in pronouncing the White Horse deal a success, though its former owner still pronounces its renovation a mystery.

But when it comes to trying to use together the supplies from different makers, all pronounced "standard," Brown looks all around to see if he is out of hearing before he pronounces anything. One special set of parts which are never the same from two different makers, and seldom the same from the same maker for two successive years, particularly incenses Brown. He pronounces them the greatest curse in all beedom, and the cause of troubles and misfits in more different places than any other bee supply thing he knows, to-wit: the ends of the top bars of frames. Just a little variance in the thickness of these ends will throw the frames too high or too low, upset lower or upper chambers, floors, covers, honey boards, escape boards, temper of all handlers and of many more bees than a hive can hold. Brown is fully justified in pronouncing them—but excuse me, I cannot just repeat Brown's pronunciation, though I can, and do, fully endorse it.

I said "honey boa ds" just above. Say them to Brown and—no, don't, it isn't safe. Last time I did it I was sorry, very sorry.

But between you and me, what is the thing? I am in a hurry just now, so write your answer and hand it to me the next time I meet you.

Brown is a pronounced success when experimenting with bees. Just ask him about packing his bees in the meal trough while the combs were stored safely in the house where moths could not corrupt or honey break through and leak. The white horse had gone then, but I wish I dared tell you the remarks of all concerned when the tax collector hitched his horse to the meal chest one day. Mrs. Brown pronounced it a scream, Brown pronounced it a case for a damage claim for bees destroyed. While the tax collector was too out of breath chasing the horse to pronounce even a part of what he felt.

Brown has a glorified idea of keeping bees in winter without combs, just packing them up in small boxes, a slab of food on top, a handful of meal below and bran all about. At present he pronounces it a dream.

I know another chap, a down east Yankee, who tried a similar scheme and he pronounced the results mixed. Yes, quite, meaning the bees, meal, food, chaff and ideas.

I was about to add another of Brown's pronouncements, but I just heard he is badly stirred at the advanced prices of bee fixings, and think I will wait until another time.

Don't pronounce all this visionary, for you may awake and find a lot of it true; they would not be the first bee visions which came true and confounded the sages.

I have some other pronouncements, but they will keep, and keep the editor happy by keeping, for he likes things short and sweet. He isn't very tall himself.

Rhode Island.

Arab houses and palm trees at Elche, Spain.

THE VALUE OF LAVENDER

By Mrs. I. A. R. Fick

Two items, one in the November issue of the American Bee Journal, and the second in the December number, regarding the dual purpose in the cultivation of lavender (**Lavandula vera**), for its commercial value to druggists and distillers of perfumes, and also for its value as a honey producing plant, ought to be of more than passing interest to large and small beekeepers.

When it is stated: "In Italy it is

eminently nectariferous" and in Australia it is estimated "one acre of lavender will enable the bees to store a ton of the finest flavored honey every year," further information seems well worth the seeking.

Lavender thrives best in light and rather dry soils, well supplied with lime, but it may be grown in any light, well drained loam, fully exposed to the sun, and in altitudes from 1,300 up to 6,600 feet above sea level. In favorable climates the leaves are persistent, or nearly so, and in colder regions it requires protection of coarse litter or evergreen boughs. In ideal localities it proves hardy and evergreen, and grows from 2 to 5 feet high.

Specific information obtained from prominent nurserymen and the Bureau of Plant Industry states: The **Lavendula vera** is not easily grown from seeds, but may easily be jropagated from cuttings and, if they are properly cared for, every one should grow.

The plants grow profusely, and when used for oil, the flowers are distilled at once without drying. If the flowers are wanted the tops are dried in the shade and the flowers later stripped off by hand.

On ordinary soil yields of 600 to 1,200 pounds per acre of fresh blooming tips are obtained. The dry weight is about four-fifths of the green weight. Under good conditions the yield of oil varies from 12 to 15 pounds per acre. During the first week in March, 1921, prices quoted in the wholesale market of New York for these products were as follows: Lavender, flowers, ordinary 18 to 24c per pound; select flowers, 21 to 25c per pound. If in addition to this may be placed the value of 1,000 pounds of honey (authority, Von Mueller, in his book, which is published by the Government at Melbourne, Australia," December American Bee Journal, 1920), it will be readily seen the cultivation of lavender serves a double purpose in its usefulness and in its increased honey profit to the beekeeper.

Inquiries sent to the leading drug houses and to distillers of perfume in the North, East, South and Middle West brought replies of great similarity:

"Lavender blossoms sold commercially in this country are imported from Europe, for we find the plants do not bloom as freely here."

"The American lavender is unsuited for perfumery purposes. The French lavender is always used."

"All lavender flowers used for the manufacture of lavender oil are purchased abroad, and not in this country."

"We use only imported lavender flowers in our manufactory operations."

To the question, "Why is lavender imported?"

"Owing to high cost of labor."

"We are inclined to think it cannot be cultivated here to an advantage, because of the cost of production."

"Lavender blossoms and oil are imported into this country. The reason given is that the lower wages and cheaper living costs which obtain in most foreign countries make it possible for them to produce and send their commodities to this country at prices lower than those necessary to yield a reasonable profit to the American producer."

Replies to the question, whether it were worth while to attempt the cultivation of lavender on a commercial scale, revealed the fact that, "There is a considerable demand for lavender flowers." Samples of flowers would be welcomed. If the quality were satisfactory, they would meet with a sale, "but your price must be lower than that of the imported article."

A very great number of firms, both drug and perfume manufacturers, buy from 5 to 10 tons a year.

After all is said, is it worth while? The writer thinks it well worth testing its merits as a honey producer, and also for its blossoms. As the writer has been fortunate enough to procure seeds from abroad, time will tell the conclusion of the story.

The **Lavender officinalis, vera** is the specie producing flowers of superior quality.

New York.

MISSOURI PROVIDES INSPECTION

I have some good news for beekeepers in Missouri. After years of waiting for State aid, we have finally got a bill through the Legislature and signed by the Governor, which will be a blessing to all beekeepers in the State. Most of the bees in this part and some other parts of the State were completely killed by disease, except bees in the hands of men who knew how to treat it. Not many knew how, either.

A year ago I sent over $1,000 back to customers who had made first payment to book orders for queens. This was done as soon as I found foulbrood was getting too close, as you know a man is not supposed to ship out queens when foulbrood is in the neighborhood. And it was a good thing I quit, because it showed up among my bees last summer and fall; don't know how bad it may be this spring.

The appropriation is only $3,000. The State Board appoints a State Apiarist, he to appoint as many local deputies as needed to do the work. This saves traveling expenses, and will make the money go further than it did under the old law, which provided for only one inspector to do all the work in the State. Here is hoping that we get it cleaned up. When the inspector comes to my house we will give him the best eats and the best bed in the house, for he is a very important animal, to be sure. A. F. Diemer.

(The appropriation mentioned above is not sufficient. But "half a loaf is better than no bread," and beekeepers may secure all the help they need by and by.—Editor.)

MORE ABOUT FIR SUGAR

Since the publication of Mr. Lovell's article on fir sugar in our March issue, we have been endeavoring to secure a photograph showing this unusual occurrence. Through the kindness of Mr. John Davidson, Botanist of British Columbia, we are able to reproduce the picture herewith. In response to our letters Mr. Davidson furnishes some further information, as follows:

"I beg to acknowledge receipt of your letter of April 13th, and also a copy of the American Bee Journal containing the article by J. H. Lovell. In it I observe that he mentions that a beekeeper in Victoria speaks of the ground being covered with an exudation, and to me this article would lead one to infer that the Douglas fir sugar has been found in that vicinity. I have no reason to believe that such is the case; on the contrary, it is most unlikely, owing to the climatic conditions.

Samples of Douglas fir with a white incrustation have been forwarded from Victoria to this office by correspondents anxious to know if this was the sugar described in my arti-

An exudation of fir sugar on a branch of Douglas Fir in the dry belt of British Columbia.

cle in the 'Canadian-Field Naturalist.' All specimens received from that locality proved to be resin, which the merest amateur could easily have ascertained.

The distribution of the sugar-bearing trees in British Columbia is limited to certain dry belt areas; and through correspondence I have received from botanists in certain of the West States, I have reason to believe that this Douglas fir sugar is found on trees growing in regions presenting similar ecological conditions to the limited area in British Columbia where sugar-bearing trees are found.

I would strongly discourage applying the term 'honeydew' to this product, as the term is usually applied to the result of the work of insects.

In replying to the query contained in the article 'Do any other species of cone trees exude honey?' I have a recollection that in some districts in Europe this sugar is obtained from young shoots of the Larch; in fact, Melezitose indicates its connection with the Larch. (Meleze-Larch tree. French).

The point of scientific importance which interested me most was the fact that this particular sugar is found in a greater percentage on Douglas fir than any other known plant, so that for commercial supplies it is possible that British Columbia will replace Turkestan and Persia in furnishing melezitose.

From a botanical point of view the account was of interest from the fact that it had not previously been recorded."

John D. Davidson,
Botanist in Charge.

MARKETING HONEY

By Charles C. Schneider

In regard to the advisability of marketing honey locally, I fully realize it is the paramount issue with the modern beekeeper.

While at no time an extensive beekeeper, I have, however, been in close touch with bees in the past thirty-five years.

When a boy of 16, it was my fortune to be a near neighbor to an old-time beekeeper, Mr. Christopher Fronce, in the suburbs of Erie, Pa. (I do not know that he is still living. The last I heard of him he was situated at Springfield, Pa.) It was often my pleasure to help him in his apiary of from two to three hundred colonies, from which he produced from three to four tons of comb honey, mostly basswood and white clover.

Mr. Fronce was the only beekeeper in that locality, at that time, producing honey in quantity, and invariably sold his entire crop to commission houses. It has often struck me as odd that he did not try to market his honey locally, as he was not more than one mile from the center of the city, having, at that time, a population of about 50,000.

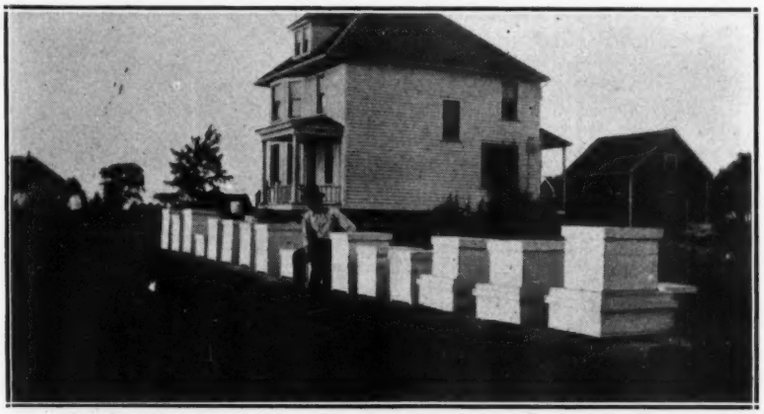
I am sure there are a great many beekeepers located near populous centers, who could work up an extensive trade in nearby towns to an advantage to themselves in the way of greater remuneration for their product, and in this I wish to state my experience in local marketing.

At one time I had an apiary in the South, and as I could not get more than 8 cents for comb honey by shipping it, I concluded to follow the last shipment of 3,200 pounds to Detroit (my home town) and market the shipment locally, and had no difficulty in handing it out at from 15 to 20 cents per pound. I will state, however, that the sections were well cleaned and white. The honey being from Spanish needle and fall asters, was capped from yellow to dark. I did not hear one complaint on color of cappings; also, as might be expected, there was considerable leakage, owing to a shipment of 800 miles, and I did not find it necessary to discount one comb on account of leakage. On the contrary, in numerous cases, it increased sales to more combs, and in some instances whole cases, by the customers getting a taste of the honey, on the spot, from their fingers. True, the grocerymen found all kinds of fault with it, and I did not make any sales to them, but they had the satisfaction of seeing me hand out more honey on the public market in two weeks than most of them possibly sold in their whole career. This set me to the notion that there is more to be made in producing less honey, with less equipment, where a local market is afforded.

Our trade is mostly from the apiary, the past few years, and I feel certain we could dispose of ten tons of honey per year, could we produce so much, without going more than a city block from the apiary. Our apiary is located on the main highway leading from Detroit to Mt. Clemens, and not more than 200 feet from the highway, in full view of all traffic between these two cities, five and one-half miles from Detroit City Hall, and eighteen miles from Mt. Clemens, and we have some very good customers in Mt. Clemens, who invariably stop at our apiary for their winter's supply of honey, although they have neighboring beekeepers at home. To this I would say, "Appearances." Note "Appearance" of view of part of our apiary inclosed, with the "French-German" sitting on a box of "dynamite." Tourists from all parts of the country stop to take a sample of Michigan honey home with them, and they say that appearances induced them to stop. (Forgive me if I am vain enough to believe it). When painting up the apiary and keeping the grass cut, the sale of honey was farthest from my mind. It was prompted by the pride and pleasure I have in bees, and I am more than pleased to find the public in the same frame of mind, and reason tells us that the more wholesome and pleasing an article appears, the more salable it is; it being understood, of course, that all persons passing by know a beehive when they see one. For instance, the city youngsters, whom we frequently hear remark to dad, "Oh, Papa, look at the little dog houses."

There are some who may think it too laborious and costly to paint an apiary every year. This is quite true, and not necessary. It is much better not to paint until it becomes necessary to do so to preserve the hives, as too much paint is nearly as bad as no paint at all. On the other hand, it is quite possible to clean up the hives as bright as new, every season, by washing them down with a good standard washing powder until the time comes when they need painting, and then apply two coats of good grade white lead and oil, using one-fourth turpentine in the first coat.

Michigan.



Apiary of Charles C. Schneider, in Detroit, Michigan.

SHOULD EVERY FARMER KEEP BEES?

By J. H. Tichenor

Reader, would you hesitate to induce your neighbor to keep cows, lest you damage the dairy industry? Or hogs lest you hinder the pork industry? Or hens, lest you bring the production of the hen to naught?

Co-operation in bees, like cows, will mean greater production, with the minimum cost to producer. It will demand the best, in quality. It will make inspection laws worth while. It will create the habit of honey eating, which, once acquired, is seldom abandoned. It will cure your neighbor of that spraying disease, as he can no longer poison your bees without poisoning his. Where I used to live years ago, farmers were all growing the Wealthy apple. Did it

bring down the price? No, but it attracted buyers, created competition. Results: Good prices to the grower at his door. In this world we are, in a measure at least, our brother's keeper, and to defeat his interests is but to defeat our own.

Wisconsin.

SUPPLIES AGAIN

By J. E. Crane

I have just received the American Bee Journal for April and was much interested in my friend Latham's appeal to the "manufacturers of bee supplies," and Kennith Hawkins' reply, pages 134-135. Mr. Latham has stated the matter fairly, as the average beekeeper will look at it, and I believe Mr. Hawkins shows very conclusively why it is impossible for supply manufacturers to reduce their prices and live. He, too, is right, as some beekeepers will look at it.

I believe he is quite right when he says there is no necessity for snowy white sections or show-case shipping cases. Indeed, I believe the average eastern honey looks quite as well, or even better in brownish sections than in very white ones. Unless the honey is very white the white section makes it look a little off color. As for high prices for sections, we have not felt it much as yet, for we ordered a two years' supply some two years ago, getting a discount for putting in our order early, and also, I believe, another discount for the large number ordered at one time. As for shipping cases, we may save much. In a catalog before me I notice they are quoted with glass, at $87.50 per hundred. We use corrugated shipping cases with corrugated partitions, costing but one-fifth as much. These are quite as good, or even better, and are preferred by dealers here in New England. Here is what one dealer says of it: "We have no words but praise in speaking of it. * * * As you know, we ship this honey over all New England, and wherever it has gone we find the same words of praise for this package, and that it accomplishes all it claims."

Here is what another says of it: "I believe you have an excellent thing in the corrugated shipping case, and hope it will come into general use."

We have used this case for fifteen years, with entire satisfaction. Not only does it carry honey safely and is less expensive, but it can be set up in half the time required to nail up a wooden case. This is not an advertisement. While we have a patent on this case, we are not selling patent rights, and anyone can use them who desires to do so.

In the matter of sections, we can get along without them if we choose. We can take our surplus in shallow frames, cut it out, let it drain, and then put it up in two-ounce cartons, placing four dozen of these in a larger corrugated case. Some beekeepers are already doing this, but I believe it will not suit the average beekeeper as well as another way I will now speak of, and practiced by a friend of mine. He takes all his surplus in shallow frames and cuts it out, all that is nice, and puts it in small fruit jars holding five pounds, with edge of the combs on the bottom of the pail. In selling, he charges so much a pound for the honey and enough more to cover the cost of the pail. He does not pour extracted honey into the pail to fill the interstices, as is done in Texas with chunk honey. He informs me he has had no trouble in shipping it to distant markets, without breakage. He is no slouch of a beekeeper, for his crops of honey will average nearly 10,000 pounds a year. He sells much of it at the door, where he has a large trade, and ships the rest away. Now, by this method he pays nothing for sections, and saves the work of setting them up, cleaning them and weighing each section separately. His method requires no cartons, another saving. If he ships his honey away, 6 of these small pails can be put in a corrugated or fibre shipping case costing not more than 10 or 15 cents; so the entire cost of his surplus honey, aside from the labor, will be but one-half cent a pound. As I have said above , he charges the cost of the pails over to the buyer.

Mr. Latham is very modest in his estimates of beekeepers' supplies, as he does not mention the cost of crates or carriers in which to ship tne fine honey cases, which would add one or two cents more to the cost of each section. And now, Mr. Hawkins, let us see what would be the cost of putting up 10,000 sections of honey with beekeepers' supplies:

10,000 sections	$200.00
Foundation	100.00
Per cent of loss	200.00
Cartons	300.00
Expense of marketing	100.00
Shipping cases	400.00
Carriers	$150.00
Labor	600.00
	$2,050.00
Add to this freight and profits of wholesale and retail dealer	850.00
Total	$2,900.00

Or 29 cents a section. Where does the beekeeper's profit come in?

Vermont.

MATERIAL FOR GOVERNMENT INVESTIGATION

During the summer the Bee Culture Laboratory of the Bureau of Entomology desires to obtain whatever information is possible regarding the presence of adult diseases of bees in the United States. It is already known that **Nosema apis,** a protozoan parasite found in the alimentary canal of adult bees, is rather widely distributed, but the amount of damage done by the organism is not well known. It is not known whether the mite found by Dr. Jno. Rennie and his associates in the so-called Isle-of-Wight disease is present in the United States. The Bureau will greatly appreciate the assistance of beekeepers who note any abnormal condition of adult bees, if they will mail samples in for examination. In most cases it will probably not be possible to give directions for treatment, since so little is known concerning diseases of adult bees. A report will, however, be made on each sample, telling what has been found in it.

Since there will usually not be time to send to the Bureau for a mailing box, it is suggested that live diseased bees be mailed in a queen mailing cage, or dead bees in a wooden or stout cardboard box. Live bees are desired when possible. Bees sent in glass bottles or tin cans rarely reach the laboratory in fit condition for examination. A letter stating the conditions observed and the amount of disease will be helpful. Address Dr. E. F. Phillips, Bureau of Entomology, Washington, D. C.

BEEKEEPERS BY THE WAY

Dr. S. B. Fracker.

The Entomologist of Wisconsin

Dr. S. B. Fracker, State Entomologist of Wisconsin, whose picture is shown herewith, is responsible for the enforcement of the foulbrood laws of his State. Dr. Fracker has under way a very energetic campaign to rid Wisconsin of bee diseases. His plan of operation is spoken of as the area clean-up plan. When work is undertaken in any region it is the purpose to be very thorough and to make sure that every diseased colony receives attention. Dr. Fracker contends that since it is possible to rid a small area of disease in this manner, that it is therefore possible to do the same thing in a larger territory and he hopes to demonstrate that it can be done for an entire State. We certainly wish him success and are pleased to note that the beekeepers of the Badger State seems to be co-operating freely. Ready co-operation on the part of the beekeeper is the first essential to success of any movement in this direction.

UTILIZING STRONG HONEYS

By L. H. COBB

Several years ago I had my bees gather a big crop of honey from hoarhound along the creek and roadways around her, and while it looked as nice as any honey we had, it was so bitter that we could not eat it at all. It had been stored in the same frames, partially, that contained the last of the main flow honey, and because of this some of it was rather mild in flavor, and this gave us an inspiration. We had eaten some of this mildly flavored honey and it was very much like hoarhound candy in flavor. We sold some of it for cough syrup, and then found that people liked it for a change from the regular clover honey for table use. In fact, we extracted the whole late crop and by adding some clover honey to it had a splendid new honey that was in ready demand.

One year we had a big crop of heartsease honey. While some are prejudiced against this honey, others liked it, but we found that it sold much better if we mixed it with the clover honey. Goldenrod honey is rather strong flavored, also, but not objectionable to us, but probably we get little goldenrod honey not well mixed with other fall flowers. There are many patches of mint plants along the roads in many parts of the country, and where these occur I imagine they will flavor the honey almost as strongly as did the hoarhound I mentioned, although not so objectionably. Yet I am sure mixing the flavored honey, to tone down the rankness, will make it more appreciated by the consumers.

A local honey trade will welcome a change in flavor now and then, and it is well worth while to give it to them if we can.

One year I was short of honey to fill my orders and I sent to Michigan for some raspberry honey, and bought some California honey also, thus providing a change with the honey I would have to secure from outside sources anyway, and my patrons showed their appreciation. One patron who had quit using clover honey for the time, saying that they were getting tired of it, began on the raspberry honey and pronounced it the finest honey they had ever had at their house. A couple of months later they were back on clover honey, but they had enjoyed the change, even though they soon tired of the new honey.

Kansas.

A SWARM SACK

Take two pieces of lumber ¾x2 in. by 16 or 18 ft. long; put the flat sides together and nail all but about 5 or 6 feet. Then take a sack (burlap) and in its mouth fit a wire or steel hoop. Fasten this hoop in securely with thread or wire and staple the hoop to the pole by spreading the end where it is not nailed, and nailing to the inside.

To hive a swarm of bees, slip the sack over it and give it a sharp jar. Most of the bees will then be in the sack. Turn the sack inside out in front of the hive and start the bees in a little smoke. Joe R. Sterling.

Mississippi.

HONEY PLANTS OF FRANCE

By Cannell

Most of the native honey flora belongs to the labiatæ, cousins of the California sage; lavender of three kinds, thyme, sage, mountain pennyroyal (**Satureja montana**), rosemary, wild marjoram, horehound, mints.

Among plants belonging to other families are two kinds of heather (spring and fall), borage (escaped?) various thistles, absinthe, a kind of goldenrod (**Mula viscosa**), and others. I do not mention introduced trees and plants such as locust, fruit bloom, orange, alfalfa, sainfoin, carnation, clovers (five kinds), and I might say that these last are rare around me.

1. **Lavandula spica** (probably **L. vera**), limestone hills above 2,500 feet. Sometimes cultivated. (From this plant is distilled the oil of lavender from one drop of which, probably, is made the many gallons of lavender extract so well and favorably known to the American barber). The plant blooms in July and August. July 1-10, August 10-20). It yields slowly, but steadily, from 25 to 75 pounds of rich, perfumed golden honey, much prized over here, and selling for about 60 per cent more than white clover (8 to 15 francs at present writing).

2. **Lavandula grandifolia** (or big-leaved) grows on same hills, but at from 1,200 to 2,500 feet, as it blooms later than spica the yield is light, except in wet years. N. B. I never saw this plant.

3. **Lavandula stoechas** grows in sandy soil near coast and seems to prefer a granite residual of colluvial soil devoid of lime. It is usually found with heather, which likes an acid soil. The yield is pretty fair, I believe, but in this region the **L. stoechas** or **maritima,** grows with heather, which spoils the quality. I never heard of this plant being distilled like **L. spica**

4. Thyme (**Thymus serpyllum** and another) neither important.

5. Sage (several, not important).

6. Mountain pennyroyal blooms after **L. spica** in same region, and yields heavily some years a honey of good quality somewhat darker than lavender honey (or so reputed); as the pines yield in August a dark honeydew of vegetable origin, the pines may be responsible for the darker color. 7. Rosemary blooms from about October 1 to April 1; a very slow but sure yielder of a very choice honey. The famous Narbonne honey is partly rosemary. I would not care to keep bees in this region if rosemary were not fairly abundant.

8, 9, 10 and 11. Marjoram, horehound and two or three mints; all useful, none exciting.

But the two lavenders (**Stoechas** and **Spica**) and rosemary would be a great addition to any American region where they would grow.

MANITOBA BEEKEEPING

By H. W. Sanders

In your April issue you make editorial mention of the possibilities of Manitoba beekeeping as outlined in our reports of the Manitoba Beekeepers' Association last month. The article is worded, however, in such a way that it might be supposed that we have here in Manitoba conditions similar to those described by Mr. West in his article called "Beekeeping in Sunny Alberta," in which, as you say, the winter problem caused by the "Chinook" winds are very serious.

As a matter of fact we hardly ever get a "Chinook" as far east as Manitoba. I have known them in the Western part of Saskatchewan to come along and thaw the snow in winter, but we very seldom have a thaw of any importance here in Manitoba. There is usually plenty of snow, and the best wintering we have seen here has been in specially constructed outdoor bee cellars constructed along the usual lines. I have been wintering my bees in one of these and the temperature has scarcely varied from 43 degrees all winter.

Our problems have been along the lines of those of Minnesota beekeepers—the difficulty of getting bees to full strength in time for the flow, the occasional dry season that gives no crop and that leaves the bees in poor shape for winter, dysentery on account of poor food, and so on.

Personally I am coming to favor a hive consisting of 1½ stories, Langstroth, with a telescopic cover 10 to 12 inches deep and lined with some non-conducting material. This gives us a capacity equal to all demands, and which will contain any amount of stores. It also allows the bees a means to get across the hive in winter (an important matter where they are often in the cellar for six months) and at the same time it employs standard goods, and allows the beekeeper to change his combs around into supers, or to extract them, etc., as methods of swarm control are urgently necessary here in some seasons, and also because our honey will sometimes granulate solid in the comb.

I am pleased to say that we have as yet no disease problem.

There are great possibilities for honey production in the North here, and any amount of market, as Manitoba still imports large quantities of honey.

Manitoba, Canada.

RAPE

In the December Journal you say something of free seeds on page 411. Now this Chinese rape must be the same rape that they have in Europe. I have seen large fields of it in the Netherlands. Beekeepers there will move their bees near fields of rape and give sometimes a good rent for a location. The seed is sowed preferably in August on summer fallow in a very fine seedbed, in rows about

3 feet apart. The plants are cultivated like corn and early in the spring cultivated again and laid by as corn. It will bloom before white clover and the seed is pressed as flaxseed and the oil is used for cooking purposes. The oil cake is used for stock food. I do not think it a profitable crop for this country, as the seed is saved by hand.

G. W. Osterhouse.

Idaho.

A LITTLE EXTENSION WORK

By Alton L. Logan

One beautiful afternoon in August, with the goldenrod and Spanish needle in full bloom, the telephone bell rang and the excited words I heard were: "One of our 'hives' of bees has swarmed out and we don't know what to do."

Arriving at the farm I noticed the farmer and his wife standing at a safe distance watching the swarm, which was clustered on some weeds intermingled with wire. I took an empty hive and a newspaper. I then shook the bees on the newspaper in front of the empty hive, and we watched for the queen, and clipped her wing.

I removed the cover from the empty hive the bees were entering, and it was not long until I discovered the bees returning to the old stand. I opened the parent hive and discovered it was full of honey except a part of two frames, which was filled with sealed brood covered up with a handful of bees. I placed a super of sections with foundation in them on top of the hive-body. By this time nearly all of the bees had returned, so I then released the queen at the entrance and she soon joined her colony once more.

About 10 days after, I returned to this farmer's home and placed another super on this hive-body and later on I took off forty sealed sections filled very nicely. I showed the farmer how to winter his bees. To date he has enough honey for winter, with a hive-body full of stores.

Too many bees have swarmed out and have perished on account of crowded conditions in the hive which can be easily avoided if understood.

THE EDITOR'S ANSWERS

When stamp is enclosed, the editor will answer questions by mail. Since we have far more questions than we can print in the space available, several months sometimes elapse before answers appear.

Honey and Syrup

Recently my attention was directed to a syrup which was said to have honey in it. Its taste suggested a honey flavor. On inquiry I can find no one who knows whether honey is ever used to flavor any of the table or commercial syrups. Can you enlighten me or direct me to a satisfactory source of answer?

OHIO.

Answer.—Quite a number of dealers in syrups give their products a pretty name, such as mentioned in the American Bee Journal for January, "Honey Gold," or "Red Clover," in order to draw customers to a product which is mainly corn syrup or glucose, made artificially from corn starch. Those dealers add a small per cent of honey, and sometimes a little sugar syrup, in order to improve the flavor. They usually buy strong flavored honey for that purpose, because it is cheaper, and also because it adds to the flavor. Strong honeys like the heather of Europe, are in demand for that purpose.

Stings for Rheumatism

I have a friend in the Senate who is very anxious to try out the bee-stinging treatment for rheumatism, and you have something on that somewhere. We receive your Bee Journal, but have been unable to find anything in it on the bee-stinging remedy for rheumatism.

NEBRASKA.

Answer.—We have no regular set of instructions for this treatment. The best information which I ever received concerning this treatment was obtained from the late Wm. Stolley, of Grand Island, in your State. He was a large honey producer and quite a physician after Nature. His method was to give one sting of bee on the arm every other day and to increase the dose, after the patient became used to the poison, giving as many as 3 stings daily until relief came.

There is no doubt of the efficacy of bee poison as a cure for some kinds of rheumatism. But when we have to deal with "sciatica," bee poison is not effective. I suffered from this complaint for some years, until, during a visit to Europe, I was advised by a competent doctor to abstain from eating meat. This was in 1913. Since that time, I have consumed less than one-fourth the meat that I used to eat, and have not suffered a single day from "sciatica." If your friend's complaint is of this sort, I would urge that you advise him to try that very simple remedy.

What we eat, what we drink and what we do have everything to do with our health or disease.

Beekeeping as a Business

1. How many hives would it take to provide a net income of $2,500 to $3,000 per year in an average location such as we have in the farming districts of the middle west, assuming that the apiary is given proper care and prices remain about as they are now?

2. Would one man be able to handle this number with very little help?

3. Do most of the one-man apiaries dispose of their honey to commission men, or sell it locally, or some other way, and which do you think is the most satisfactory way? Is there ever any trouble getting a market?

4. Would you advise working for comb honey, or extracted, or both, and which method requires the most equipment?

5. What would you estimate the least ground necessary for the best arrangement of the number of colonies one man can take care of?

6. Do you think success would be more certain if the outapiary system was used?

OHIO.

Answers.—1. It is impossible to give, in dollars and cents, the approximate amount that a man can make out of bees, just as it would be impossible to tell how much a farmer might expect from a farm, because bees, like farms, depend so very much on location, seasons, prices, etc. In paragraph 715 of "The Hive and Honey Bee," we wrote that at least 50 pounds of honey may be expected from a colony of bees, on the average, every season. Some localities will yield twice that, average, others will probably fall far short. Of course much depends upon the management. Half of that, at least, would go in expenses.

2. One man could hardly expect to net $2,500 out of bees without help.

3. Beekeeper are usually poor salesmen and they often dispose of their honey to wholesalers or to commission men, but it would be much better if they would do some retailing. Yes, there is often trouble getting a market, if one is not a good salesman.

4. Extracted honey is more profitable to me than comb, but it requires a little more capital at the start.

5. You can keep all the bees that should go in one spot on a single town lot of land.

6. If you go into beekeeping largely, you will need outapiaries.

Commercial Beekeeper

At a school for beekeepers held in Walla Walla, Wash., March 21, there were 75 present, and the Walla Walla (Washington) County Beekeepers' Association was organized. This question was asked, and I said, "I'll ask the editor of the American Bee Journal:" "What is a 'Commercial' Beekeeper?"

WASHINGTON.

Answer.—I believe that a very good man to answer that question is the one who asks it. Mr. York, the former editor of the American Bee Journal. However, I'll try to reply.

A commercial beekeeper is a man who keeps bees for money as well as for pleasure, and who studies the matter so as to get as large returns as possible. We are, none of us, as good commercial beekeepers as we ought to be. In the first place we should keep bees in the most favorable spots. Then we should do what we say should be done, in order to succeed. We should not imitate the old parson who told his parishioners: "Do what I say; don't do what I do." Let us all try to be a little nearer the ideal "commercial beekeeper."

Clipping Queen's Wings—Crooked Combs

1. Please tell me how to clip a queen's wings.

2. What is the best thing to do with a hive that has crossed combs? NEBRASKA.

Answers.—I do it as follows: Catch the queen across the thorax with the fingers, then slip the blade of the scissors under one wing and clip about half of its length, or you may clip one-third of each wing. Dr. Miller advises cutting the two wings on one side as short as they can be conveniently be clipped.

2. Transfer the combs, during fruit bloom, to other frames Or, if you don't like the job, put another story on top. By and by, if you use foundation, the queen will move to the upper story. Then put an excluder between. In a few days the brood will all be hatched out of the crooked combs. You can then remove that hive and transfer the combs at leisure. If you wish to hurry matters, you may drive the bees and queen to the upper story, then put on the escape so she may not be able to go down again.

Bees in the City

I have 64 colonies of bees here that are in the city limits and have no complaint of anyone ever being stung, but I have a neighbor that is trying to have the City Council make me move them out of the city limit

IOWA.

Answer.—If your bees do not sting people

the fact that they are kept within a city cannot be made a nuisance. In the case of "Clark versus the City of Arkadelphia, Ark., the Supreme Court held that, "Although bees may become a nuisance in a city, an ordinance which makes the owning , keeping or raising of bees within the city limits a nuisance, whether it is in fact so or not, is too broad, and is not valid." There were other cases decided in the same way.

However, if your bees should sting people, they could recover damages and force you to remove them.

Bees will not fly through a wire mesh 1 inch or less in diameter. So a very safe thing for you to do is to establish a small net fence around your apiary, on the sides next to the street or the neighbor. I have seen this in the City of Peoria, Ill., with very satisfactory results.

A little gift of a comb of honey, to the neighbor who dislikes the bees, donated at the time of harvesting the crop, may smooth down much dissatisfaction or prejudice.

A Drone Layer

The hive of bees in my apiary that I examined to see if they were short of supplies had 4 or 5 pounds of honey and lots of pollen stored, and they seemed to be working strong. They are Goldens, and have one of the finest-looking queens you ever saw, but there was not a bit of worker brood in the combs, but lots of drone brood in worker cells. This is a young queen, about 8 months old. Now what is the trouble, laying workers, or an infertile queen, or what? MISSOURI.

Answer.—That queen is a drone-layer and absolutely worthless. The sooner you replace her with another, the better it will be for the colony. If the colony is strong, you might save it by killing the queen and giving them at once some brood just hatching from the eggs, in place of their drone brood. If you can give them a good queen it would be still better.

As far is I am able to judge, the queen must have been disabled by chilling. That sometimes makes a fertile queen a drone-layer. However, she may simply be an inferior queen which has already lost her fertility. Such accidents happen more readily among the Goldens than among the others, because of their being too much in-bred.

Transferring

I have a colony of bees in a box hive and would like to transfer it. I have a 10-frame Jumbo depth dovetailed hive with five frames of drawn comb and the rest with full sheets of foundation. I have had no experience, and would like to know the easiest way to transfer to this hive. IOWA.

Answer.—When the colony becomes strong enough, which ought to be in May or June, turn the box hive bottom side up, and fit the other hive, right side up, on top of it, without its bottom board, using such slats or short boards as may be needed to close any too wide openings to the outside. In short, fix your hives so that the bees can go from one to the other, and also so they can go back and forth to the field.

The queen will go up into the movable-frame hive as soon as she is crowded for room below. If she does not move soon enough to suit you, you may drive her up by using a little smoke and drumming the bees for a few minutes. After the queen has been in the upper hive 21 days, the brood will all be hatched out below. You may then remove that lower story and use it as you see fit.

You can also put the lower story, or box hive, on top of the frames of the other hive, but the queen will probably be slower in going down to it than she would be in going up. The same precautions are necessary in either case, to close up any openings that would give too much exposure of the combs.

Goldens

Are the Golden Italians as good honey gatherers and general-purpose bees as the three-banded? Also, what was their origin? OHIO.

Golden Italians are not a special variety of the Italian race, although there are occasionally in Italy bees of a slightly lighter shade than the average. The bees which may be seen in Italy, from one end of the country to the other, have three yellow rings on the abdomen next to the thorax. These rings being more or less transparent, the color of the honey within their abdomen has some influence upon their yellow appearance. In ordinary conditions, the yellow resembles more a fair leather color. Their temper is mild and they hang quietly upon the combs when properly handled, while the common bees cluster under the combs and often fall to the ground in spite of the care taken. This is the pure race of Italian bees.

By selecting yellow queens from the yellowest bees, beekeepers, especially in America, have succeeded in producing an artificially made variety of "golden bees." Their color is brighter and the rings of the abdomen have nearly all more or less of the transparency of the three rings common to all the bees of their race. Usually the "goldens" are as quiet on the combs as the ordinary Italians and as peaceable in temper, but they are often less prolific, because of having been selected *for color* at the expense of other qualities.

Some "goldens" have been bred through a mixture with Cyprian bees. The Cyprians are of brighter hue than the Italians, having a golden shield upon the tip of the thorax. They are really "copper-colored." It has often been remarked that their color is well matched with the name of their native island, Cyprus, the name of which is derived from, or similar to, the Latin word "cuprum" (copper). The Cyprians are very active, very cross, and almost impossible to subdue. The Golden Italian bees which have been produced by the mating of Italian mothers with Cyprian drones retain to a certain extent the activity and irritable disposition of the Cyprians. So when we meet golden Italian bees which are of irascible temper, we usually suspect them of having inherited those traits, at some time or other, from the Cyprian ancestors.

Thus it is impossible to say whether the goldens are as good honey gatherers as the ordinary pure Italian bees. Much depends upon their descent. Personally, I have no desire to breed from golden Italian bees. At least, the question of color is a very secondary question, in my mind. The qualities we should seek in our bees are: honey-gathering qualities, prolificness, gentleness, with color as an adjunct which may be pleasant to have, but not in any way indispensable.

ODDS AND ENDS

Can the Mite Be Killed?

A. J. Ridley, in British Bee Journal, suggests that if the newly-discovered mite which is called **Tarsonemus Woodi,** is shown to be actually the cause of Isle of Wight disease, it might be killed by smoking the bees with sulphur smoke, and says: "To my mind it may be a question of deciding how little will kill the mites without harming the bees."

Wintered Without Loss

My bees, 32 colonies—have wintered without loss. They are working fine on fruit bloom and dandelion. I have never seen clover look more promising at this time of year than it does now. Surely the indications are for a good honey crop.

B. A. Manley.

Milo, Iowa, April 21.

Ellis County Beekeepers Meet

The Beekeepers' Association of Ellis County, Texas, held their annual field meet April 8, at the home of T. W. Burleson, in Waxahachie. In spite of very inclement weather, the meeting was well attended. One of the main features of all field meets is the picnic dinner, and those present certainly thank Mrs. Burleson for the wonderful "eats" placed before them. The work of the afternoon was of a character that is seldom found at beekeepers' gatherings. A regular school of instruction was held. Several box hives were transferred to movable-frame hives and the full process of shipping pound packages and the building of colonies from pound packages was gone through with. Every one present was highly delighted with the methods that were used by Mr. Burleson and it is needless to say that everyone learned much of value. Visitors were present from both Dallas and Johnson Counties. The Ellis County Beekeepers' Association is one of the best in the State and has been extremely active in the work of encouraging better beekeeping in North Central and Eastern Texas.

Guadalupe Valley Field Meet

Five of the prominent beekeeping counties of Texas, located along the valley of the Guadalupe River, have been united in the Guadalupe Valley Beekeepers' Association for a number of years. Their annual picnic was held April 13 on the Guadalupe River near Seguin, over fifty beekeepers were present and quite an elaborate program was carried out.

After a bountiful picnic dinner, the beekeepers were addressed by Mr. Louis H. Scholl, editor of the Beekeepers' Item. Mr. LeStourgeon, of the Texas Honey Producers' , then told of the correct packing of honey, emphasizing the fact the beekeepers must develop their local trade to a far greater extent than ever before.

H. B. Parks, Secretary of the American Honey Producers' League, spoke on the relationship between the nectar-yielding plants of the San Antonio district and the problems of beekeeping.

Miss Alma Hasselbauer, Secretary of the Texas Honey Producers' Association, spoke of the work of associations as a help to the beekeeper.

Mr. Alex, of the Texas Experiment Station, told of the work of the State

Queen Rearing Yard and explained the new policy of the foulbrood inspection.

The Guadalupe Valley Association has held regular meetings for five years and has been one of the foremost associations in making displays at County and District Fairs.

League Notes

The announcement that the League will have a trade mark or seal has met with approval of a large number of the prominent honey producers of the United States and many suggestions are being received relative to the design. Mr. C. W. Aeppler, of Oconomowoc, Wis., who has had experience in the designing and registering of trade marks, has offered his services to the League in designing a trade mark. Mr. Aeppler desires, if beekeepers have ideas which they consider worthy of consideration, that they will communicate the suggestions either to the Secretary of the League or to himself. Mr. Aeppler is well qualified to do this work as, in addition to being a designer and teacher, he operates a large apiary.

Dr. E. F. Phillips, Chairman of the Bureau of Research, has named Dr. J. H. Merrill, of Manhattan, Kans., and Prof. H. F. Wilson, of Madison, Wis., as his committeemen. Dr. Phillips is to be congratulated on his choice of associates, as the beekeeping public has come to recognize Dr. Merrill and Prof. Wilson as being foremost among those engaged in the investigation of apiary problems.

Clifford Muth has named the following as his committeemen: A. L. Boyden, Medina, Ohio; Wesley Foster, Boulder, Colo.; C. H. W. Weber, Cincinnati, Ohio, and Ernest Kohn, Grover Hill, Ohio. Mr. Muth has selected these gentlemen, as in each case the man named is not only a large beekeeper, but also is engaged in the selling of honey and of bee fixtures; so knows both sides of the game. They bring to the Committee the strength of years of experience in advertising, and should give the beekeepers of America the very best service which can be rendered.

Reports coming to the Secretary show that the money pledged for advertising purposes at the Indianapolis meeting is now largely available. In cases where the money had to be collected by the Secretary of the State Association, the money has largely been collected and considerable of it has been turned in. The appeal made through the Bulletin for individual beekeepers to tax themselves has met with approval of many of our large beekeepers and the Secretary has received quite a number of contributions from this source.

The League movement is gaining headway in almost every section of the country and the Secretary has been informed by H. A. Scullen, of the Oregon State Beekeepers' Association, that that Association has taken definite steps to join the League.

Again the Legal Aid Bureau and the officers of the League have been called upon to assist the beekeepers in obtaining justice in legislation. Pennsylvania is attempting to pass a law, which will necessitate the inspection of new bee fixtures before they can be delivered into that State. This provision seems foolish to the beekeepers, and a very vigorous protest is being made against the passage of this portion of the bill.

H. B. Parks, Secretary.

Introducing Virgins

I have read, in February Journal, by Allan Latham, "A System One Hundred Per Cent Successful." Like most good things, it takes care and patience. I practice making swarms, small, about one pound. I buy package bees in the South and some I shake, from home colonies, onto two combs, with a little brood, if I can furnish it, but very often none; I give them a virgin queen, also from the South, by hanging the cage between the combs, candy end down (directions with cage), only I put the queen in first. Some writer has said that "It is possible to introduce a virgin, but not practical. I am getting some vigorous bees by thus crossing pure bred virgins with hybrids.

L. H. Snyder, Altoona, Pa.

A Note From California

We have had a short rainfall in this section of California, while north they have had an abundance. Recently we have had an unusual killing frost, which will cause the shortest fruit crop that we have had for years. In many places the bees are using stores much faster than they are coming in, except among the orange blossoms. It is now too late to expect any more heavy rains, but without hot east winds to take the surface moisture, we expect some honey. Southern California will produce a short crop this season, unless conditions change.

M. H. Mendleson, Ventura Calif.

Do It in Time

The beekeeping axiom is "Learn what is to be done, and do it in time." The importance of the last five words cannot be overestimated.

Ontario to Rear Queens

The recent Legislature gave us a grant of $4,000 for the establishing of a queen-rearing apiary in Ontario and we expect an annual grant of $2,000 for maintenance. This should enable us to establish an apiary in the southern part of the Province with two objects in view; the supplying of pedigreed and resistant stock. While it would undoubtedly take us a few years to achieve our first object of sending out a very much improved stock of queens, we hope to be able to make a continual improvement along these lines. European foulbrood is still very prevalent in parts of the Province, and by sending out goodly numbers of resistant stock, we should be able to overcome this disease to a large extent.

Our Annual Summer Short Course in beekeeping runs from June 13 to 17, and we hope to have with us at that time Prof. Rea, of Cornell, and Prof. Kindig of Michigan. This course is largely practical and free to those desiring to gain experience in beekeeping.

F. Eric Millen,,
Provincial Apiarist.

Sugar Statistics

The annual report of the American Sugar Refining Company for the year 1920 is out. Its President, in his message to stockholders gives a very thorough and comprehensive explanation for the extreme fluctuation in sugar prices during 1920.

During governmental control of sugar, prices remained fairly constant. France was the first to decontrol sugar, and the result was a mad scramble on the part of French interests to get all the sugar possible. This, coupled with the fact that our government refused to make arrangements for buying the sugar crop, made a steady outflow of sugar from here to Europe.

Then, suddenly, without warning, control was abandoned in the United States. Sugar was scarce and a still wilder scramble ensued. Naturally sugar began to be diverted from Europe back to this country, some sugar exported being returned on the same ship, to take advantage of our higher prices.

There could be but one result. The influx of sugar was so great from everywhere (some even coming from the interior of China) that a break in the prices was inevitable.

During the year, the extreme variation in prices was 19½ cents, a much higher variation than ever experienced in the history of the United States.

The report is very interesting and, we believe, can be obtained by addressing a postal to the American Sugar Refining Company at 117 Wall street, New York City.

The Queen, According to Butler

If by her voice she bid them go, they swarm; if being abroad she dislike the weather or lighting place, they quickly return home again. While she cheereth them to battle they fight; while she is well they are cheerful about their work; if she droop and die they will never again enjoy their home, but either languish till they be dead too, or yielding to the robbers, fly away with them.—Chas. Butler. The Feminine Monarchie. 1623.-

The Mid-West Horticultural Show

The Iowa Legislature, in its closing day, provided an appropriation of $16,000 for the Mid-West Horticultural Show for the coming two years. While this show is held in Iowa, it is open to exhibitors of the whole middle west, and attracts exhibits from Wisconsin to Arkansas, and from Colorado to Ohio. Beekeeping is made a special feature of this exposition, and we hope that the exhibits of apiary products at the next show will be more nearly equal to those presented by the fruit and vegetable

growers. When the time and place of holding the next exhibition is announced, we will endeavor to give the information place in our columns. A splendid opportunity will be open to the beekeepers to advertise their products to the thousands of visitors who will attend and at the same time secure the premiums offered by the management. Secretary Herrick writes that they hope to increase the amount of premiums offered on honey exhibits.

Census Reports

Nevada has 11,998 colonies of bees, as compared to 8,401 colonies in 1909. The honey crop for 1919 was 577,576 pounds, or a per colony production of 50 pounds.

Utah has now 25,061 colonies and their production in 1919 was 1,232,239 pounds, of 50 pounds per colony.

Masachusetts had 7464 colonies in 1909 and only 6573 now. The per colony production is 10 pounds.

No honey item is included in the Alaska census report. Evidently there are no bees there, although we have subscribers there.

Kansas had 81,337 colonies of bees in 1920, as against 73,737 in 1909. The per colony production in 1919 was a little over 7 pounds, or a total of 597,875 pounds.

"Eat Mississippi Honey" Week

The beekeepers of Mississippi inaugurated a special campaign, "Eat Mississippi Honey," which extended over the week April 10 to 16: The object, of course, was to interest the public in honey in general, and Mississippi honey in particular. All hotels, cafes, drug stores, merchants and especially the buying public, were appealed to to help make the movement a real success. Judging from some newspaper clippings coming to this office, much desirable publicity through the press was given to the project.

Beeswax Refuse Now Third Class

The Consolidated Classifications Committee of the railroads has acted favorably on the change of rate in "Beeswax refuse" from first to third class in the Southern classification, making a uniform rate of third class throughout the country. Refined beeswax takes first-class rates. Anyone shipping slumgum, refuse, etc., should make sure that it is billed out as "Beeswax Refuse."

Wisconsin Averages 28 Pounds

According to the census, Wisconsin bees averaged 28 pounds of surplus honey per colony in 1919. There are 107,646 colonies of bees in Wisconsin, as against 95,638 colonies in 1909. The honey crop for 1919 was 2,676,683 pounds.

A Tribute to McCray

The report of the Montana Board of Entomology, recently issued contains a fine tribute to the memory of Dr. A. H. McCray, who died of spotted fever June 14, 1919. Doctor McCray will be remembered by the beekeepers for his work on bee diseases. After leaving the Department of Agriculture he went to Montana, where he was engaged in investigation of spotted fever, a disease which is not yet fully understood. It was while attempting to learn something concerning the disease that he was stricken. His passing was mentioned in our August, 1919, issue.

Accompanying the article above mentioned is a photo of Doctor McCray and extracts from the funeral oration.

North Dakota Bee Census

Bees are scarce in North Dakota, according to the census. There are now 708 colonies, as against 495 in 1910. The honey production for 1919 was 12,514 pounds.

Oregon Again

The beekeepers of Clackamas County, Oregon, at a recent meeting formed the Clackamas County Beekeepers Association, with the following officers:

President—W. T. Lee, Canby.

Vice President—George Dennison, Oregon City.

Secretary—J. Sickler, Milwaukie, Ore.

Treasurer—Mrs. E. McFarren, Walluga.

The beekeepers of Multnomah County, at a recent meeting, organized with the following officers:

President—E. J. Ladd, Portland.

Vice President—E. H. Bauer, Portland.

Secretary-Treasurer — Edgar W. Stahl, Portland.

Another New One

The beekeepers of Glenn County, California, met at Orland March 18 and organized the Glenn County Beekeepers' Association. Officers elected were:

President—M. A. Sayler.

Vice President— A. Eferlein.

Secretary-Treasurer—H. M. Gillas.

Directors—H. H. Hill and E. M. Cripe.

Lehigh Valley Beekeepers Organize

The beekeepers of the Lehigh Valley have recently organized an association with an initial membership of 34. The officers are: A. L. Brodhead, President; J. E. Linde, Vice President, and O. H. Urffer, Secretary.

New Jersey Bees

There were 12,451 colonies of bees in New Jersey in 1919, as compared with 10,484 colonies in 1909. The honey crop for 1919 was 157,717 pounds.

Bees in West Virginia

West Virginia reports 89,873 colonies of bees in 1919, as against 110,673 colonies in 1909. The honey crop for 1919 was 919,689 pounds, or about 10 pounds per colony. It will be noted that there has been a big decline in the number of bees in ten years.

LESSONS FROM THE HIVE

By B. Romain

Division of Labor—A hive is like a gigantic factory, where every one of its 50,000 workers is at work according to its capacity—using its talents for the benefit of the community. There are carriers, soldiers, sentinels, detectives, nurses, architects, scouts, scavengers. Even youngsters are turned into use for home duties.

Our modern manufacturers have copied the bees in allotting each man a part of the work, in which they can attain such a wonderful speed and accuracy.

Economy—Bees in the midst of their stores never use more than needed; no wasteful banquets, no squandering, no scattering. Their New Year's day, that is their swarming day, seems to be the only exception. Then permission is granted to give full scope to their digestive powers. Yet, that liberality is turned to good account, for the production of the material needed for the new home.

We can only mention the bees' love of order, cleanliness, patriotism, harmony, entente cordiale, their spirit of democracy, from the queen mother down to the last new-born babe.

Bees make their nectar from the sweetest juice of flowers, and that little theft they repay by an immense good in helping their fructification.

Bees go out only to work and come back as soon as possible. They never loiter out of doors. Community life is essential to their existence. What a precious example of family life, which parents and children should enjoy at home for the benefit of all.

The bees have more honey than venom, so our general disposition should be mildness, with occasionally a point of pungency.

To recapitulate, we should learn from bees:

1—To use our time well, not only for our profit, but for others.

2—To save money and economize food—for future needs, so great in war time.

3—To lay up for ourselves, while on earth, treasures of good deeds which we will enjoy for life everlasting—that we call to make investments for eternity.

In ending, may I suggest that St. John the Baptist be honored as Patron of beekeepers (feast 24th of June)? He who was depending mostly on honey—found in trees or in rocks. The non-Christian may take Samson, the inventor of frame hive (from the lion's ribs).

China.

FROM THE OLD FILES

"I don kno ov enny bissiness on the breast of man so lazy and useless without actually killing him, az huntin' wild bees in the wilderness."—J. Billings. (American Bee Journal, November, 1871, page 119.)

"Where did Noah preserve the bees during the flood? In the archives."—(American Bee Journal, 1872.)

CLASSIFIED DEPARTMENT.

Advertisements in this department will be inserted for 5 cents per word, with no discounts. No classified advertisements accepted for less than 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 20th of the month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

SWEET CLOVER SEED

SWEET CLOVER—Biennial yellow; ideal for bee pasturage and soil improvement. New seed, recleaned and graded, unhulled 8c per pound. R. M. Hanna, Skillman, N. J.

FREE SAMPLE (Hubam) annual sweet clover (scarified). Genuine Hughes strain, 2c postage. Jas. H. Kitchen, R 5, Springfield, O.

BEES AND QUEENS

QUEENS ON APPROVAL—Bees by package or colony. Tested queen, $2; select untested, $1.50; all other grades, $1. Bees without queen, 1 lb., $3; 2 lbs., $5; colony, $10. Birdie M. Hartle, 924 Pleasant St., Reynoldsville, Pa.

QUEENS—Italian, 1 untested, $1.50; 6, $8. See my ad on page 247 of this issue. Willard A. Friend, Bedford, Ohio.

FOR SALE — Three-banded Italian queens untested, $1.50 each; 6, $7.50; 12, $14. Select untested, $1.75 each; satisfaction guaranteed. W. T. Perdue & Sons, R. No. 1, Fort Deposit, Ala.

JUST to let all my customers know I am still breeding 3-banded bees, Dr. Miller stock queens: 1 untested queen, $2, 6 for $11. Selects 25c each higher. Curd Walker, Jellico, Tenn.

QUEENS—H. Brenner strain, 3-banded Italian. Equaled only by the best. Untested, $1.50 each, $15 per dozen. Dr. A. Wright, Kingsbury, Texas.

FOR SALE—Three-banded Italian queens, after May 25, untested, $1.50 each, 6, $8, 12, $15. Tested queens, $3 each. The above queens are all select. Robt. B. Spicer, Wharton, N. J.

MY famous three-banded Italian queens, $1.50 each, 6 for $8, after June 1. J. W. Romberger, Apiarist, 3113 Locust St., St. Joseph, Mo.

QUEENS ON APPROVAL—Bees by package or colony. Tested queens, $2; select untested, $1.50. All other grades $1. Bees without queen, 1 pound, $3; 2 pounds, $5; colony, $10. A. M. Applegate, 840 Main St., Reynoldsville, Pa.

QUEENS from real producers, three-banded Italians: 1, $1.50; 6, $8.25; 12, $16. Trinity Valley Honey Co., Route 8, Dallas, Texas.

SIMMONS QUEENS, bees and nuclei; goldens and three-band. Fairmount Apiary, Livingston, N. Y.

ITALIAN QUEENS—Three-banded, select untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness, and perfect markings. Price, May and June: $1.50 each, 12 or more $1.25 each. Send for circular.
J. H. Haughey & Co., Berrien Springs, Mich.

FOR SALE—Three-banded Italian queens ready June 1. Day old virgins, 55c each. Select untested, $1.50 each; 6, $8; 12, $15; 50, $60. Nuclei with queens, 2-frame $7.50; 3-frame $10.50. No disease; satisfaction guaranteed and correspondence answered promptly. A. E. Crandall, Berlin, Conn.

MR. BEEKEEPER—If you enjoy preparing supers and removing honey, then you will be wise to head your colonies with my vigorous Italians. See larger add elsewhere. Herman McConnell, Robinson, Ill.

HARDY ITALIAN QUEENS, $1 each. W. G. Lauver, Middletown, Pa.

FOR SALE—Unsurpassed Italian queens, ready June 1; untested, $1.50; 6, $7.50; 12, $14; 50, $55; 100, $105. Tested, 1, $2.50; 6, $13.50. My queens are actually laying before they are sent out. J. D. Harrah, Freewater, Oregon.

FOR SALE—Hardy northern bred Italian queens and bees, each and every queen warranted satisfactory. For prices and further information write for circular. H. G. Quirin, Bellevue, Ohio.

THAGARD'S ITALIAN QUEENS—My 3-banded are "bred for quality"; try them and be convinced. Circular free. V. R. Thagard, Greenville, Ala.

GUARANTEED ITALIAN QUEENS AND BEES. Orders filled day received. See larger add elsewhere. Dr. White Bee Co., P. O. Box 71, Sandia, Texas.

HEAVY LAYING Italian queens that produce hustling 3-banded workers. Untested, $1.25; tested, $2. Safe delivery and satisfaction guaranteed. There is no disease in my apiaries. Order now and get them on time. P. M. Williams, Ft. Deposit, Ala

BEES AND QUEENS from my Carolina apiaries, progeny of my famous Porto Rican pedigreed breeding stock. Elton Warner, Asheville, N. C.

FOR SALE—Golden or 3-banded virgins, 60c each, or $6 per dozen; safe arrival. R. O. Cox, Rt. 4, Luverne, Ala.

SWARTS' Golden queens produce golden bees of the highest quality. Untested $1.50 each, 6 for $8; tested, $3. Satisfaction guaranteed. D. L. Swarts, Lancaster, Ohio, Rt. 2.

FOR SALE—Golden Italian queens, untested, $1.50 each, dozen $14. Bees by the pound a specialty. Write for prices on bees. E. A. Simmons, Greenville, Ala.

FOR SALE—Queens and bees, Italians and goldens, $1.50 each, $15 per dozen; 1 lb. bees, $5, 2 lbs. bees, $9. If queen is wanted with bees add the price of queen. Safe arrival and satisfaction guaranteed in United States or Canada. Cash or certified check must accompany all orders where parties are not known or satisfactorily rated. Graydon Bros., Rt. 4, Greenville, Ala.

FOR SALE—Leather colored Italian queens, tested, until June 1, $2.50; after, $2. Untested, $1.25; 12, $13. Root's goods at Root's prices. A. W. Yates, 15 Chapman St., Hartford, Conn.

THREE-BANDED ITALIANS only, that have been bred to a high standard of excellence. I never had any disease in my apiary. Safe arrival and satisfaction guaranteed. Untested queens: 1, $1.50; 12, $15. Tested queens: 1, $2.25; 12, $25. Jul Buegeler, New Ulm, Texas.

FOR SALE—Root's strain of golden and leather-colored Italian queens; bees by the pound and nuclei. Untested queens, $1.50 each; select untested, $2 each; tested, $2.50 each; select tested, $3 each. For larger lots write. Circular free. A. J. Pinard, 440 N. 6th St., San Jose, Calif.

THREE-BAND BREEDERS from one of the heaviest honey-gathering strains in the State. $10 each. Delivery May 15. A. V. Small, Augusta, Kans.

WE are booking orders for our golden Italian queens for spring delivery after April 15. Untested queens, 1, $1.50; doz., $15; select untested queens, 1, $1.75; doz., $18; virgin queens, 1, 75c; doz., $9; tested queens, 1, $3; doz., $36 Safe arrival guaranteed. Tillery Brothers, Georgiana, Ala.

BOOK YOUR ORDERS for QUEENS now—Goldens, $2; tested, $3; banded, $1.50; tested, $2.50; six or more, 10 per cent less. Clover Leaf Apiaries, Wahoo, Neb.

EDSON APIARIES now booking orders for queen bees for delivery during season of 1921. Prices: One untested queen, $1.25; 50 untested queens, $57.50; 100 untested queens, $100. Orders filled in rotation; first shipments March 1, 1921. Edson Apiaries, Gridley, Calif.

BEES AND QUEENS from my New Jersey apiary J. H. M. Cook,
1Atf 84 Cortland St., New York City.

HIGH GRADE ITALIAN QUEENS—Send for catalog. Jay Smith, R. 3, Vincennes, Ind.

BEES BY THE POUND, ALSO QUEENS—Booking orders now. Free circular gives prices, etc. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas, E. B. Ault, Prop.

GOLDEN and 3-banded Italian queens; tested, $1.25; untested, $1. No disease. Safe delivery and satisfaction guaranteed. C. B. Bankston, Buffalo, Texas, Box 65.

FOR SALE—Golden Italian queens, tested queen, $3; untested queen, $1.50. J. F. Michael, Winchester, Ind.

HUMMER QUEENS—Untested, $1.50 each, $15 per doz.; Tested, $3 each, $22 per doz. A trial will convince you that they cannot be beaten. Safe arrival and satisfaction guaranteed. Nuclei at same old price.
Geo. A. Hummer & Sons, Prairie Point, Miss.

WILL SHIP a few choice queens with frames of brood, $4 each. Jes Dalton, Bordelonville, La.

PRITCHARD QUEENS—(Three-banded Italians). My first season selling direct to the trade. June prices: Untested, $1.75 each, 6 for $9.50; select untested $2 each, 6 for $11. For delivery after June 30, deduct 25 cents for each queen. A liberal discount will be given on larger quantities. I will have a few choice virgins, tested, and breeders to spare. Write for prices. Queens clipped free of charge on request. Acknowledgment and directions for introducing sent on receipt of order. Safe delivery and satisfaction guaranteed. Specify date of shipment desired. Otherwise orders will be filled in rotation. Arlie Pritchard, Medina, Ohio.

FOR SALE—Golden or 3-banded queens, untested only. Safe arrival and satisfaction guaranteed. Prices till July 15: One, $1.50; six, $8; dozen, $15. Ross B. Scott, La Grange, Ind.

ITALIAN QUEENS, $1 each, or $10 per doz. after June 1. Will book a few more three-frame nuclei of black or hybred bees with Italian queen, for delivery after June 15, at $5.50 each. These will be fine to winter for early spring work. Otto Diestel, Elza, Ga.

DAY-OLD ITALIAN QUEENS—High quality, low prices. Safe introduction described in circular. Delivery and satisfaction guaranteed in U. S. and Canada. Price, 1, 50c; 100, $50. Order early. James McKee, Riverside, Calif.

SELECT QUEENS only. Three-band and leather colored Italians. Tested, $2.50; untested, $1.50 each. Geo. W. Coltrin & Son, Mathis, Texas.

BEGINNING June 5, I can supply you with 3-banded Italian queens by return mail. Select untested, $1.50 each, or $15 per dozen. Tested, $2.50 each. I also have nuclei for immediate shipment; 2-frame nucleus, $5; 3-frame nucleus, $6.50. Add price of queen wanted to price of nucleus. Frank Bornhoffer, Rt. 17, Mt. Washington, Ohio.

NUCLEI—2-frame hybrids with queen, $5.50. Clarence Foote, Delanson, N. Y.

FOR SALE—Nuclei and queens, leather-colored, heavy producers. Nuclei, 2-frame, $5; 3-frame, $7. Queens, untested, $1.50; tested, $2. Single story hives, flat crates of 5 at $16. R. Kramske, 1104 Victor, St. Louis, Mo.

QUEENS—Good Italian stock, selected and reared with utmost care, especially for requeening. Foresee your needs and receive particular attention. Each, $1.50; 5, $7; 10, $13. Satisfaction guaranteed. Elsa J. Fischhaber, 1320 Genesee Ave., Saginaw, Mich.

FOR SALE—Select untested queens, $2 each, 6 for $11. No very large orders solicited. Ready about June 10. Dr. C. E. Sheldon, Coeur d'Alene, Idaho.

CALIFORNIA ITALIAN QUEENS at special prices. After June 15 and to October 1, 1, $1.25; 6, $7; 12, $13; 25 ond over, $1 each; 100, $90. See larger ad elsewhere. Circular free.
J. E. Wing, 155 Schiele Ave., San Jose, Cal.

NUCLEI—We make a specialty of shipping 2-frame nuclei. Write for special prices for June delivery. Queens at the following prices: Untested, $1.50 each; 6, $8; 12, $15; 50, $60; 100, $100. Tested queens, $2.50 each.
Cotton Belt Apiaries, Roxton, Texas.

FOR SALE—Fine tested queens, year old, $2; Silver Spangled Hamburg chickens and eggs; rare old violin.
Elias Fox, Union Center, Wis.

THE ITALIAN QUEENS OF WINDMERE are superior three-banded stock. Untested, $1.50 each, 6 for $8; tested $2.50 each; select tested, $3. Prof. W. A. Matheny,
Ohio University, Athens, Ohio.

LARGE, HARDY, PROLIFIC QUEENS—Three-band Italians and goldens, pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness and color. After June 1, untested queens $1.50 each, 6 for $8, 12 or more $1.40 each, 25 or more $1.25 each. Tested queens $3 each, 6 for $16.
Buckeye Bee Co., Justus, O.

FOR SALE—Pure three-banded Italian queens, reared from the best honey producing mothers, mated to pure drones. Untested, each $1.50, six, $8, twelve, $15. Tested, each $3, six $14, twelve $25.
H. N. Boley, Hillsboro, Iowa.

WE believe we have the best Italian queens obtainable. Our new system is working wonders. Book your order now for 1921. Untested, $1.50; tested, $3; virgins, imported mothers, 50c. F. M. Russell, Roxbury, Ohio.

FOR SALE—Young three-banded Italians bred from best honey producers. Untested, $1.50; tested, $3. Ready June 1. Book orders now.
W. C. Young, Box 249, Des Plaines, Ill.

SIMMONS strain Italian queens, golden and three-band. Virgins, $1 each, $10 per dozen. A few fine breeders for sale.
Fairmount Apiary, Livingston, N. Y.

QUEENS—I am now offering queens at pre-war prices. Untested, 1, $1.25; 25 or more, $1 each.
W. H. Moses, Lane City, Texas.

FOR SALE—20 colonies of Italian bees in 8 and 10-frame dovetailed hives.
Carl Franke, Mauston, Wis.

CHOICE ITALIANS—Select queens, tested, $2.50; untested, $1.50 each.
Geo. W. Coltrin & Son, Mathis, Texas.

HONEY AND BEESWAX

WHITE sweet clover honey with small per cent of basswood, in 5-gallon cans, case of 2 cans, $14, one can $7.50. Ten cases at 10c per pound. Sample 10c. C. S. Engle,
200 Center St., Sioux City, Iowa.

FOR SALE—One ton white clover extracted honey in 60-lb. cans, at 15 cents a pound.
Harry Chandler, R. D. 5, New London, O.

GIVE me your best offer for 2,000 lbs. nice clover and basswood extracted honey. Put up in 10-lb. pails or 60-lb. cans.
Walter Jaster, St. Peter, Minn.

ATWATER and his crew are working almost day and night to produce a big crop to supply you and your customers.
Meridian, Idaho.

FOR SALE—Very fine quality basswood-milkweed mostly milkweed) honey in 60-pound cans. P. W. Sowinski, Bellaire, Mich.

FOR SALE—Clover extracted honey, 15c per pound; amber and buckwheat, 12½c, two 60-pound cans to case; amber in 50-gallon barrels, 10c per pound.
H. G. Quirin, Bellevue, Ohio.

HONEY—15c per pound. Walter Reppert,
Gen. Deliv., Shreveport, La.

FOR SALE—Choice clover extracted honey. State quantity wanted.
J. D. Beals, Oto, Iowa.

FOR SALE—Extracted honey. Write for prices. A. L. Kildow, Putnam, Ill.

FOR SALE—Honey. Immediate shipment f. o. b. New York, in 60-lb tins: Calif. white orange, 19c lb.; Calif. white sage, 16c lb.; white sweet clover, 14c lb.; Calif. L. A. sage, 13c lb.; West Indian L. A., 10c lb.; West Indian L. A., 10-lb. tins, 6 per case, 15c lb.
Hoffman & Hauck, Woodhaven, N. Y.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co.,
204 Walnut St., Cincinnati, Ohio.

SUPPLIES

FOR SALE—Hoffman extracting frames in original boxes, $4.50 per 100.
Bert Willard, Plainview, Ark.

SAVE MONEY on your shipping cases, tin and glass honey containers, etc. Our free price list tells you how. If you rear queens for sale, be sure to send for our price card of mailing cages. The Rattery-Hamilton Co.,
Almont, Mich.

FOR SALE—One new Cowan reversible extractor with brake No. 18; has 12-inch comb pockets; never been used, $35. 25 10-frame Excelsior covers, used, in goou condition, 60c each or $12 for the lot; 25 10-frame comb honey supers, used for Danzenbaker sections, in good condition, $1 each, or the lot for $20.
Lynn Z. Silsbee,
20 Leonard St., Dansville, N. Y.

FOR SALE—Ten 10-frame beehives and 22 automatic rifle; or will exchange for bees.
Thos. Cordner, Sparta, Wis.

TEN DOLLARS takes my 10 10-frame painted 4x5 section supers.
O. Biermann, Malcom, Iowa.

FOR SALE—50,000 Lewis No. 1 sections at $5 a thousand. Sizes 4¼x1½ beeway, 4¼x1⅜, 4¼x1 15-16, 4¼x7 to ft, 4¼x2, 4x5x1¾, 4x5x 1⅞,, 3⅝x5. Also supers, covers, bottoms, etc. Write for list.
C. C. Brinton, Bloomsburg, Pa.

FOR SALE—Push-in comb queen introducing cage, 25c postpaid. Try it. Safest way known.
O. S. Rexford, Winsted, Conn.

FOR SALE—Owner wants use of outside warehouse, we must vacate, and offer for quick sale, 1-story 8-frame single-wall hives per package of 5 at $15, 10-frame size at $17.50. Staple spaced frames, per package of 100, at $9; 4x5 shipping cases with glass, per package of 25 at $15. Goods first-class. Offer good only as long as this stock lasts.
A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—200 new 10-frame Root hive bodies, with frames; all in flat; were never uncrated, $340 takes the lot.
Herbert Kietzer, Vernon Center, Minn.

FOR SALE—200 absolutely new 10-frame hives complete, consisting of hive-bodies, tops, bottoms, tin rabbets, nails and Hoffman self-spacing frames knocked down, in lots of 5, $14; 200 full-depth supers with frames, $1.20 each; 500 lbs. of medium brood-foundation at 78c per pound
A. Irish, Doctortown, Ga.

WANTED—To quote special prices on queen cages in quantity lots, to breeders. State quantity.
A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—Good second-hand double-deck comb honey shipping cases for 4⅛x4¼x1⅞ sections, 25 cents per case, f. o. b. Cincinnati; terms cash with order.
C. H. W Weber & Co.,
2146 Central Ave., Cincinnati, O.

FOR SALE—Good second-hand empty 60-lb. honey cans, two cans to the case, at 60c per case, f. o. b. Cincinnati. Terms cash with order. C. H W Weber & Co.,
2146 Central Ave., Cincinnati, O.

SEND us a list of goods wanted and will quote you lowest prices. We are the money-saving house. Price list free. Try us.
H. S. Duby & Son, St. Anne, Ill.

FOR SALE

FOR SALE—25,000 pounds scrap candy, 2½c per pound in barrel lots; about 200 pounds per barrel.
Sterling Products Company, Evansville, Ind.

FOR SALE—Boiler wax press, like new, $18.
F. O'Donnell, Rock Creek, Minn.

FOR SALE—Real estate in San Joaquin Valley, Calif.; great dairying and beekeeping section. If coming to California let us locate you. Inquiries cheerfully answered.
Bradley & Robertson, Riverdale, Calif.

FOR SALE—Cheap—My 20 10-frame painted, 4x5 section supers for $20.
O. Jewell, Mineral Point, Wis.

FOR SALE—70 strong hives of bees, 1,000 brood-frames and lots of other supplies. $2,000. Also, 7-room house, all improvements, lots 125x125, $6,500. A. H. Opfer,
6259 Patterson Ave., Chicago, Ill.

FOR SALE—Several hundred used 60-pound honey cans, 2 to the case. Used only once, 65c each. P. H. Outzen,
White Bear Lake, Minn.

FOR SALE—Cedar or pine dovetailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.
A. E. Burdick, Sunnyside, Wash.

Queens of Unsurpassed Quality

3-BANDED QUEENS **GOLDEN QUEENS**

Our queens are reared from selected stock taken from the best strains of Italians known. Neither trouble nor expense is spared to produce queens of unsurpassed quality. They have proved themselves to be not only great honey gatherers but also, very resistant to disease, especially European foulbrood. Every queen sent out by us we guarantee to give fullest satisfaction.

Price List of Our Queens

Untested_____ $1.50 each, 6 to 25, $1.40 each; 25 and up, $1.25 each
Sel. Untest. __$1.75 each, 6 to 25, $1.60 each; 25 and up, $1.50 each
Tested _____ $2.50 each, 6 to 25, $2.40 each; 25 and up, $2.25 each
Sel. Test. ____$3.00 each, 6 to 25, $2.75 each; 25 and up, $2.50 each
We clip wings free of charge. Safe arrival we guarantee.

Ohio Valley Bee Company, Catlettsburg, Ky. Box 307

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

WANTED

WANTED—Bees on shares. Stump land with many berries and considerable cultivation; excellent harvest. No other bees within 18 miles. A. Wm. Koch, Mercer, Wis.

WANTED—Cowan extractor; pay cash; 100 Langstroth frames, $6.50; Incubators, one fourth price. Exchange for gun.
Lorenzo Clark, Winona, Minn.

WANTED—Bees on shares; 100 to 200 colonies in Northern Michigan, for season of 1921. Years of experience on a large scale.
W. A. Latshaw, Clarion, Mich.

WANTED—Bees in colonies, comb and extracted honey. Frank Coyle, Penfield, Ill.

WANTED—Beeswax, old combs and cappings for rendering on shares. Also wax accepted for trade. Top market prices offered.
A. I. Root Co., Council Bluffs, Iowa.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices.
Superior Honey Co., Ogden, Utah.

SITUATIONS

WANTED—One experienced man, and students or helpers, in our large bee business; good chance to learn. Modern equipment and outfit, including auto truck; located near summer resorts. Write, giving age, height, weight, experience, reference and wages wanted.
W. A. Latshaw Co., Clarion, Mich.

WANTED—Man with some experience to work with bees coming season. State age, experience and wages wanted, based on our furnishing board.
The Rocky Mountain Bee. Co.,
Box 1319, Billings, Mont.

MISCELLANEOUS

SAMPLE FREE—They say "It's as good now as when Hutchinson ran it." Under new ownership, our bee journal is growing fast, better every issue, a "different" kind of a journal. Let's get acquainted. $1.50 a year, and worth it.
The Domestic Beekeeper, Lansing, Mich.

WRITE for prices on two and three-frame nuclei and queens, cypress hives and frames.
Sarasota Bee Co., Sarasota, Fla.

AIREDALE TERRIERS—Fine puppies, pedigreed, and from choice strains. At stud, Jack Dempsey, IV, A. K. C. No. 292,346. Fee $15.; 10¾ in. head at 10 months old.
The Airedale Kennels, Glenwood, Mich.

LEAGUE EMBLEMS—We still have a number of U. S. Beekeepers' emblems, buttons or pins, bronze or gold. Send 50 cents and get one
American Bee Journal, Hamilton, Ill.

WANT to hear from owner having farm for sale; description, price.
Care Lakenvelder Farms, Toccoa, Ga.

BLACK SIBERIAN HARES—Enormous sizes, delicious meat and beautiful fur. Write for information and prices.
Siberian Fur Farm, Hamilton, Canada.

DR. MILLER'S BEE SONGS are in "Songs of Beedom." Ten songs for 20 cents, postpaid; 2-cent stamps taken. Also Teddy Bear souvenir postal cards, 10 for 10 cents. Address Geo. W. York, Box 84, Spokane, Wash.

QUEENS

A good queen for June means more honey for the supers.

Pure Three-Band Italians

Untested, $1.25; select untested $1.50.

D. W. HOWELL, Shellman, Ga.

QUEENS

Select Three-Banded Italians of the highest quality (one grade)

Eight hundred honey-gathering colonies from which to select the very best breeders. No one has better bees than I. Can make prompt delivery by return mail. I have not yet disappointed a customer.

PRICES	To July 1		After July 1	
	1	12 or more	1 to 49	50 or more
Untested, each	$ 1.50	$1.25	$1.25	$1.00
Tested, each	2.00			
Breeders, each	25.00			

A new customer from Missouri, where you have to show them, writes: "The dozen queens arrived promptly. They are the most beautiful I ever saw." (Name on request.) Another one, from the same state, writes: "Your 100 2-lb. packages averaged over 90 pounds surplus honey per colony; 10 pounds more per colony than the other 2-lb. packages purchased elsewhere." H. H. THALE, Durham, Mo.

Now listen to this, from Ontario, Canada: "Bees and queens purchased of you last season all wintered without a single loss. Save me 50 untested queens for May delivery." (Name on request.)

My customers say my queens stand the northern winters. They are bred up for this purpose, combined with the highest honey-gathering qualities and prolificness.

Pure mating, safe arrival, and satisfaction guaranteed. It is left with customer to say what is satisfaction.

JASPER KNIGHT, Hayneville, Alabama

BEEKEEPERS WE MANUFACTURE DOVETAILED HIVES, HOFFMAN FRAMES, SECTIONS AND SHIPPING CASES

Our hives are made of best grade White Pine, cut accurate and smooth to standard measure ections are made of Basswood polished on both sides. There are no better made.

We carry a complete line of everything used in the apiary. Our shipping facilities are as good as can be found anywhere. We want your business. We guarantee prompt and satisfactory service. Price list free.

MARSHFIELD MANUFACTURING COMPANY, Marshfield, Wis.

BEE SUPPLIES

THE VERY BEST QUALITY AND SERVICE

We have a large stock of Hives, Bodies, Supers, Foundation and other supplies ready for immediate shipment.

Give us an opportunity to quote you our prices. We are certain you will find them attractive.

If you want the Very Best Quality at the Lowest Price, send us your orders at once. All correspondence will have our immediate attention.

AUGUST LOTZ COMPANY, Boyd, Wisconsin

Glass and Tin Honey Containers

2½-lb. Cans, 2 dozen reshipping cases	$1.45 case;	crates of 100, $ 6.50
5-lb Pails (with handles), 1 dozen reshipping cases	1.35 case;	crates of 100, 8.30
10-lb. Pails (with handles), ½ doz. reshipping cases	1.10 case;	crates of 100, 12.75

60-lb Tins, 2 per case—new, $1.30 case; used, 50c.

WHITE FLINT GLASS, WITH GOLD LACQD. WAX LINED CAPS

8-oz. Honey Capacity, Cylinder Style	$1.50 per carton of 3 dozen
16-oz. Honey Capacity, Table Jar Service	1.40 per carton of 2 dozen
Quarter 3-lb. Honey Capacity, Mason Style	1.00 per carton of 1 dozen

HOFFMAN & HAUCK, Inc. Woodhaven, N. Y.

FOR SALE

IF YOU WANT THE CHEAPEST, BUY THE BEST

I am prepared to furnish for the season of 1921 twenty-five hundred two and three frame nuclei of my bright 3-banded Italian bees, headed with young, vigorous queens. These bees are free from disease, and safe arrival guaranteed. Hoffman frames wired and on full sheets of foundation; very few combs over two years old. I am booking orders now. One-fourth or one-half cash with order, balance before shipping.

Two-frame, $4.25; three-frame, $5.25. If queens are wanted, add $1.25 each.

After May 5th I will be ready to mail queens at the following prices: Untested, single $1.50, six for $8, twelve for $15. Tested, $2.50 each. Select tested, $3.50 each. Write for prices for large lots.

A. B. MARCHANT, Jesup, Ga.

Reference: Merchants and Farmers Bank of Jesup.

TENNESSEE-BRED QUEENS

Forty-nine Years' Experience in Queen-Rearing
Breed Three-Band Italians Only

	Nov. 1st to June 1st			June 1st to Nov. 1st		
	1	6	12	1	6	12
Untested Queens	$2.00	$ 9.00	$16.80	$1.50	$ 8.00	$14.50
Select Untested	2.25	10.50	18.00	2.00	9.50	16.00
Tested	3.50	20.00	35.00	3.00	16.00	30.00
Select Tested	4.00	22.50	40.00	3.50	18.50	35.00

Select tested, for breeding $7.50

The very best queen tested for breeding $15

Capacity of yard 6000. I sell no bees by the pound or nuclei except with high priced tested and breeding queens

Queens for export will be carefully packed in long distance cages, but safe delivery is not guaranteed

JOHN M. DAVIS, Spring Hill, Tenn.

Five colonies of your stock produced 2660 finished sections—the best one 616 finished sections
JOHN M. BIXLER, Corning, Iowa, February 1, 1921

FOREHANDS' QUEENS. They Satisfy, Why?

Because of 28 years of experimental work with both queen breeding and honey production.

With breeding and selecting of imported queens, I have reached a standard which is ideal. Queens as good, but none BETTER. Why experiment? Take advantage of the life experience of my breeders.

OUR SERVICE STATION

We are ready to serve you at all times, whether you desire queens or advice. Let us help you with your bee problems. All questions are cheerfully answered.

I breed three-band Italians only.

June 1 to November 1.	1	6	12
Untested	$1.50	$ 7.50	$13.50
Select Untested	1.75	9.00	16.50
Tested	2.50	13.00	24.00
Select Tested	3.00	16.50	30.00

Orders booked now for spring delivery. One-fourth the full amount with order and balance when shipment is desired. Pure mating, safe arrival and satisfaction guaranteed. Write for circular and large order discounts. Shipment to foreign countries at receiver's risk.

Bees in 2-pound packages, 1, $6; 25 or over, $5.80; 50 or over, $5.40; 100 or over, $5. Without queens.

Will begin shipping bees as early as weather will permit.

N. FOREHAND, Ramer, Alabama

2 FRAME NUCLEI

Ready to ship now. Orders filled in rotation.
Terms cash. Reference, Merchants National Bank of this city.
Prices f. o. b. Watertown:
2-frame nucleus, no queen, at $6.00.
2-frame nucleus and queen, at $7.00.

ROCK RIVER APIARIES

Box 377. **Watertown, Wisconsin**

BARNES' FOOTPOWER MACHINERY

Read what J. E. Parent, of Chariton, N. Y says: "We cut with one of your Combined Machines last winter 50 chaff hives with 7-in. cap, 100 honey-racks, 500 frames and a great deal of other work."

W. F. & JOHN BARNES
995 Ruby St., ROCKFORD, ILLINOIS

Stutts Italian Queens are Supreme

My Italians are gentle, prolific, very resistant to foulbrood, and the best of honey gatherers. Untested, $1.25; 6, $6.50; 12, $12.50. Select untested, $1.50; 6, $8; 12, $15.

Take advantage and requeen your yard with the best strain of Italians.

I sell no nuclei, or bees by the pound. Health certificate with every queen.

Pure mating and safe arrival guaranteed.

ALFRED A. STUTT, Lincoln, Ill.

SHE-SUITS-ME queen-bees, prices for 1921: Untested Italians, $2 each; $1.75 each for 10 or more, prior to June 15. After June 15, 1 to 9 queens $1.50 each, 10 to 24 $1.40 each, 25 and up $1.25 each.

ALLEN LATHAM,
Norwichtown, Conn.

GOLDEN QUEENS 1921

Untested, $1.50 each, or 6 for $8. For 100 lots write for prices. I will begin shipping about April 20, and I guarantee safe arrival and reasonable satisfaction to everybody.

R. O. COX, Rt. No. 4, Luverne, Ala.

BEE SUPPLIES

We carry a complete stock of supplies at all times, and can make prompt shipments. Our prices will interest you.

Send Us Your Inquiries
A. H. RUSCH & SON CO.
Reedsville, Wis.

Pure Italian Queens of the Best Known Strain.—A. I. Root and H. D. Murry 3-Banded Only.

Booking orders now for immediate delivery of 2-frame nuclei, 2-lb. packages and full colonies.

Prices: Untested, 1, $1.50; 12, $14.50. Tested, 1, $2.25; 12, $24. Select tested, 1, $3; 12, $30. Two-frame nuclei, with untested queen, $6; 25 or more, $5.50;. Two-frame nuclei, with tested queen, $6.75; 25 or more, $6.25. Two-lb. package hybrid bees, each $4. Add price of queen wanted. No disease near here. Health certificate with all I have for sale. Safe arrival and satisfaction guaranteed.

P. S. Terms, one-fourth with order, balance due at shipping time.

BAUGHN STONE, Manchester, Tex.,
Formerly Murry & Stone.

BE PREPARED

BEES wintered better than for a number of years, due to mild winter. Early breeding will be heavy.

Be prepared for swarming. Do not lose the honey crop on account of lack of sections, or extracting frames. Order before it is too late.

"falcon" quality has stood supreme for over 40 years. Write for our new red catalog. We guarantee safe arrival on all shipments.

W. T. FALCONER MFG. CONCERN, Falconer, (near Jamestown) N. Y., U. S. A.

"Where the best Beehives come from"

Distributor for the Central West, WM. H. RODMAN, 2027 Main Street, Gateway Station, KANSAS CITY, MO.

ROOT GOODS—PROMPT SERVICE

We are well supplied with a complete line of Root Goods, and Airco Foundation. Our prices will save you money. We are now listing many exceptional bargains in eight frame equipment. Get our figures, if you want quality goods at best possible prices.

WERTZ SEED COMPANY, Sioux City, Iowa

MR. BEEKEEPER—

We have a large plant especially equipped to manufacture the supplies that you use. We guarantee all materials and workmanship. We ship anywhere. We allow early order discounts and make prompt shipments. *Write for free illustrated catalog today*

LEAHY MFG. CO., 90 Sixth Street, Higginsville, Missouri

J. W. ROUSE, Mexico, Missouri **A. M. HUNT, Goldthwaite, Texas**

QUEENS AT PRE-WAR PRICES

Fine, large Italian queens, guaranteed to be of very high grade and to give the best of satisfaction. Prices:

Untested, $1 each, $10 per dozen, $80 per 100. Tested $2 each.

Will also sell during the month of June, a limited number of 3-lb. packages of hybrid bees with Italian queen, shipped on 1 frame of honey and brood, at $4.50 per package.

A. R. IRISH, Doctortown, Ga.

BUY YOUR HIVES OF VOSS WOOD SHOP AT EXIRA, IOWA

Standard sizes and widths, half-lock corners, reversible bottoms, lock-cap cover. Made of selected white pine, well machined and accurately made.

Prices are in lots of 5, with frames; no foundation.

8-frame.		10-frame.
$14.50	One Story Standard	$15.90
8.10	Hive Bodies	9.10
9.45	Jumbo Bodies	9.95
4.00	Reversible Bottoms	4.25
4.25	Lock Cap Cover	4.60

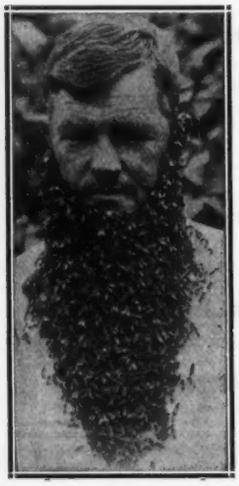
3 per cent discount in lots of 100.

Odd sizes and special, same price, if not using more material. Send sample. Prompt shipments.

VOSS WOOD SHOP
Exira, Iowa

QUEENS

Write for our catalog of high grade Italian Queens. Pure mating and safe arrival guaranteed.



1 to 4 inclusive, $3 each

5 to 9 inclusive, $2.90 each

10 or more $2.80 each

Breeders, $12.00 each

JAY SMITH, Route 3
VINCENNES, IND.

LOWER PRICES

Order from these quotations

Untested Italian queens	$ 1.25
Per hundred	98.75
Two pounds bees with queens	5.75
100 packages	550.00
Section honey boxes, No. 2 grade	12.60
Hoffman brood frames, per M	65.00
Extracting bodies with frames 10-frame size, crate of 5	7.50
Medium brood foundation, "Airco," 100 pounds	75.00
Ex. thin foundation, "Airco," 100 lbs.	82.00
5-lb. friction top pails (200)	20.50
Cases 5-gal. cans (2 in case).	1.35
5-gal. cans in bulk (100)	41.75
Double tier glass front shipping cases (100)	50.00

The Foster Honey & Merc. Co.
Boulder, Colorado

Write for our Price List
"Foster your Business"

COMB HONEY PRODUCERS MAKE MORE HONEY

By using the Rauchfuss Combined Section Press and Foundation Fastener. This is the most simple, accurate and rapid device of its kind to be had. Will put up 4,000 sections in a day, and each will be exactly right.

One Beekeeper writes: "If you have but ten colonies of bees you cannot afford to be without this great time saver."
Write for our descriptive circular.
Price $9.10. Mailing weight four pounds.

H. D. RAUCHFUSS,
Englewood, Colo.

QUALITY QUEENS AT QUANTITY PRICES

Breed Three-Band Italians only

PRICES FOR 1921

	Nov. 1 to June 30.			July 1 to Nov. 1.		
	1	6	12	1	6	12
Untested	$2.00	$ 9.75	$18.00	$1.50	$8.00	$15.00
Select Untested	2.25	11.25	19.80	1.75	9.75	16.80
Select Tested	3.50 each			3.00 each		

Breeding queens after June 15, with 2-frame nuclei, $15.00 each.

Queens are reared from mothers whose colonies are GENTLE, HARDY, and as HONEY GATHERERS will compare with any. Each and every queen reared by the latest and most approved methods, thus insuring queens that are capable of duplicating the excellent characteristics of their mothers.

I rear all my queens personally, and strive for QUALITY instead of quantity. You may rest assured that when you order queens of us you are getting among the best that can be produced. You take absolutely no risk in getting our queens for SATISFACTION and safe arrival guaranteed in the United States and Canada. Foreign shipments at receiver's risk. I sell no bees by the pound, nor nuclei, only with breeding queens. Try and estimate your needs for the approaching season and place your order early.

HERMAN McCONNELL, Robinson, Illinois

QUEENS, Select Three-Banded

Write for descriptive circular of our Select Italian Queens. Pure mating, safe arrival and satisfaction guaranteed

	May 1 to June 15			June 15 to Nov. 1		
	1	6	12	1	5	12
Untested	$2.00	$10.00	$18.00	$1.50	$ 9.00	$15.00
Select Untested	2.50	12.00	20.00	2.00	10.00	18.00
Tested	3.50	19.50	36.00	3.00	16.00	30.00
Select Tested	4.00	22.50	40.00	3.50	19.50	36.00

HARDIN S. FOSTER, Columbia, Tenn.

HAND-MOORE QUEENS

Dear sinner friends and beekeepers:

This is our queen ad. How did our queens sit on your stomach last season? Our queens are Hand's and Moore's If you like our queens tell all your neighbors about it, and remember you can always get some more from headquarters. But if you don't like them please keep your "doggone" mouth shut.

Untested, $1.50; 6 for $8. Select, $2; 6 for $10. Tested, $2.50; 5 for $10

W. A. LATSHAW CO., Clarion, Mich.

GOLDEN ITALIAN QUEENS

	Nov. 1 to June 1			June 1 to Nov. 1		
	1	6	12	1	6	12
Untested	$2.00	$ 9.00	$16.80	$1.50	$ 8.00	$14.50
Select Untested	2.25	10.50	18.00	2.00	9.50	16.00
Tested	4.00	22.50	40.00	3.50	10.50	36.00
Select Tested	4.50	25.00	45.00	4.00	22.50	40.00

BREEDERS $12.50 TO $25.00

10 per cent additional for Exported Queens. Queens for Export will be carefully packed in long distance cages, but safe delivery is not guaranteed.

NO NUCLEI, FULL COLONIES OR POUND PACKAGES.

BEN G. DAVIS, Spring Hill, Tenn.

CROP AND MARKET REPORT

CROP PROSPECT

Throughout the whole clover region represented from Maine to Nebraska, prospects are usually very good, although about half the reports from New York state there will be very little clover. Other States in which the crop seems to be spotted are Illinois, Wisconsin and Minnesota. One State which has had very poor crops for several seasons, now reports without exception, that the prospects are excellent, and that there should be a good crop of clover honey. This is Missouri.

Colorado and the Inter-mountain territory report good prospects for a crop, but most of the reports coming from Southern California are adverse, and state that the beekeepers will do well to get 25 per cent of a normal crop, although recent rains have somewhat changed the situation and make the outlook a little brighter. Prospects in Northern California are much better.

There seems to be a tendency still to hold up the retail prices to about 20 to 25 cents a pound in 10-pound cans. This, likely, is about in line with what prices should be, figuring honey on a 10c jobbing basis.

There have been a few sales of nice white honey at about 8c a pound in carlots, but the most of the honey in the last month or two has been moving at a price of from 12c to 16c per pound in a wholesale way. This, of course, includes the sales of the smaller producers who have not had to sacrifice.

As a whole, honey seems to be moving a little better than a month or two months ago, that is, to the retailer. There is still a lack of buying on the part of the jobbers and brokers, so that it is difficult to dispose of honey in carlots.

It is not likely that all of the 1920 honey will be cleaned up before the new crop comes on, but very probably conditions will be much improved over what was expected two or three months ago.

Italian Queens of Quality

Prices for 1921:

	1	6	12
Virgins	$1.00	$5.00	$ 9.00
Untested	1.50	8.00	15.00
Tested	2.00	11.00	

One-third down books order, balance one week before delivery.

Why not give my queens a trial? They are reared from mothers whose colonies are gentle, hardy and good honey gatherers. I rear all of my queens, personally, and strive for quality, not quantity. Safe arrival guaranteed in the United States and Canada.

WILLARD A. FRIEND
Box 112, Bedford, Ohio

QUIGLEY'S QUEENS AND BEES

Three-banded Italians, are bred from ideal colonies by double grafting, producing queens of superior quality; 20 years building this strain from the best honey-producing colonies. No disease; 35 years in this location. June delivery. Booking orders now.

Tested, $3; untested, $2. 6 $11, 12 $20; breeders $10, shipped on brood. Three-frame nuclei, untested queen, $9; tested, $10. Ten-frame colony, tested queen, $20. Two-pound package, untested queen, $8; tested, $9.

Purity and satisfaction guaranteed. Send for circular.

E. F. QUIGLEY & SON,
Unionville, Mo.

QUINN'S QUEENS OF QUALITY

Have no superiors—"There's a reason." Are Mandelian bred, good qualities accentuated. Gray Carniolans, Gray Caucasians, most gentle of all, prolific, hardy, vigorous, disease-resisiting white comb builders—they deliver the goods.

ITALIANS, 3-banded, line-bred, pedigreed; need no boosting; they speak for themselves.

CHAS. W. QUINN. Sabot, Va.

Established 1885

Beekeepers should send for our new catalog, free. Beehives made of white pine. Root Co.'s old standby make of supplies. Order early. Beeswax in exchange for supplies or cash.

J. Nebel & Son Supply Co.,
High Hill, Mo.

Quality Bee Supplies
FROM A
Reliable House

Without fear or favor, I place my BEE SUPPLIES and SERVICE before you.

It is the small annoyances that often grow into disastrous results. Avoid the so-called "little losses" by using MONDENG'S GOODS.

Quality is first—save time when you put your goods together, by getting supplies that are accurately made. Service is next—no delays when bee supplies are ordered from my factory.

I am ready to meet your urgent needs.

Send for my new price list.

Closing out all Langstroth and Wisconsin hives and supers. Also Langstroth triangular top-bar frames and eight-frame D. T. supers for 4x5 sections. Will sell at cost price. Write for quotations.

CHAS. MONDENG
146 Newton Ave. N. and 159 Cedar Lake Rd. Minneapolis, Minn.

THREE BAND AND GOLDEN QUEENS

that produce hustling bees. Bred to fill the supers. Our breeding stock produced 400 pounds surplus honey in 1920. Our breeding yards are several miles apart. We breed from the very best non-swarming, gentle, long-lived, prolific strains of bees and drones that thirty years' constant work can produce and money can buy. No disease. Satisfaction guaranteed.

1 Untested ---------$1.75; 12, $1.50 each
1 Tested ---------- $3.00; 12, $2.75 each

DR. WHITE BEE CO., Sandia, Texas

MOTT'S NORTHERN BRED ITALIAN QUEENS

Have a World-wide reputation. Sel. Unt., 1, $1.50; 6, $8.50; 12, $15. Sel. guaranteed pure mated or replace, 1, $1.75; 6, $10; 12, $18. Sel. tested, $2.50 each.

Filling orders by return mail at this present writing by the aid of my Southern branch. Plans, "How to Introduce Queens" and "Increase," 25c.

E. E. MOTT, Glenwood, Mich.

HONEY, ROOTS, FURS

Why not increase your profits? A 32-page booklet describing books on Bee Hunting, Medicinal Root Growing, Fur Farming, Tanning, etc., free.

A. R. HARDING, 75 N. Ohio Ave., Columbus, O.

ITALIAN QUEENS

$1 EACH

Write for Quantity Prices

O. E. TIMM, Bennington, Neb.

ITALIAN QUEENS
Raised from Italian Bees

Untested----------$1.75 each
Tested---------- 3.25 each

CHAS. BOONE SAUNDERS
Merom, Ind.

CALIFORNIA ITALIAN QUEENS

The old reliable three-band stock that delivers the goods. This stock is descendant from the A. I. Root Co.'s best breeders. Then the J. P. Moore long tongue, red clover strain was added. Next some of Doolittle's famous stock was secured, one breeder in particular, one which was selected by Mr. Doolittle himself and caged with his own hands a short time before his death, proved extra remarkable. This season the Jay Smith strain has been secured, and these are proving equal, if not superior, to anything I have ever seen. In order to keep running to maximum capacity till fall, I am offering

SPECIAL PRICES FOR JUNE, JULY, AUGUST AND SEPTEMBER

Delivery June 15 to October 1, for orders booked in advance:

Select Untested ---------- 1, $1.25; 6, $7.00; 12, $13.00; 25 to 50, $1 each; 100, 90c each
Tested ---------- 1, $1.75; 6, $10.00; 12, $18.00
Superior breeder, 1 year old, $5.00

Every queen actually laying before being caged, and fully guaranteed. I also guarantee safe arrival in United States and Canada. Circular free.

155 SCHIELE ST. **J. E. WING** **SAN JOSE, CAL.**

GOOD WILL AND GOOD QUEENS

ARE BACK OF

FOREHAND'S THREE BANDS

The Thrifty Kind

Good will has made our success.
Our good queens will make your success.
These two forces working together have made it possible for us to serve the beekeepers for over a quarter of a century.
Hearty support for twenty-nine years.
Good queens for twenty-nine years.
Each is the proof of the other. Both are proof that you will not make a mistake when you requeen with Forehand's Three-bands—the bees that are **surpassed by none, but superior to many.**
Good queens are the success of an apiary. Your success is ours. We try to help you in every way. We give you good queens and good service. We guarantee pure mating, safe arrival, and satisfaction.
We are now booking orders for immediate delivery.
Write for circular giving full information on bees and queens.

Prices:

Up to June 30	1	6	12
Untested	$2.00	$10.00	$18.00
Select Untested	2.25	11.50	21.00
Tested	3.00	16.00	30.00
Select Tested	4.50	25.00	45.00

Pound Bees from May 1 to June 15

One pound package: 1, $3.75; 25 or over, $3.50; 50 or over, $3.25; 100 or over, $3.00.
Two pound package: 1, $6.00; 25 or over, $5.80; 50 or over, $5.40; 100 or over, $5.00.
Add the price of queen wanted.

Write for prices in large quantities.

W. J. FOREHAND & SONS, Fort Deposit, Ala.

SOUTHLAND APIARIES

W. S. TATUM, Prop.

Box 585. HATTIESBURG, MISS.

DISTRIBUTORS OF

ROOT QUALITY BEE SUPPLIES
AIRCO FOUNDATION

We sell Root, Hoffman frames, full depth, $9.00. 15% off on all hives and supers, 10% off on all other supplies. Discount on quantity orders

PURE ITALIAN QUEENS

Untested	$1.50 ea.	12 or more		$1.25 ea.
Tested	2.50 ea.	12 or more		2.25 ea.
Select Tested	3.00 ea.	12 or more		2.75 ea.

BEES IN POUND PACKAGES
Shipped on Comb of Foundation

1-pound package bees, no queen,	$3.00	25 or more,	$2.75
2-pound package bees, no queen,	5.00	25 or more,	4.75
3-pound package bees, no queen,	7.00	25 or more,	6.50

TWO AND THREE-FRAME NUCLEI

Two-frame nucleus, no queen	$4.50
Three-frame nucleus, no queen	6.00

SPECIAL

One-frame brood and pound bees, no queen	$4.00
Two-frame nucleus, with young tested queen	6.50

Bees will build up faster with frame of young brood in the hive.

FULL COLONIES

Good strong colonies on good combs, well filled with brood and in new painted hives.

Colony in new 8-frame hive, no queen	$18.00
Colony in new 10-frame hive, no queen	20.00

Select your queen from above and add her price.

BEE SUPPLIES

ROOT'S GOODS AT FACTORY PRICES WITH WEBER'S SERVICE

We carry several carloads of bee supplies, and are able to give prompt shipment at all times. Our motto is a customer must be satisfied. Give us a trial and we will show you how quickly we will answer your correspondence. Send your order and it will follow 24 hours after we receive it. Our new catalog will be ready about January 15; send for same. We have thousands of satisfied customers, why not you? Send a list of your wants and we will quote you.

C. H. W. WEBER & CO., 2163-65-67 Central Ave., Cincinnati, O.

THE AULT 1921 BEE SHIPPING CAGE—Patent Pending

1st. It is a dark cage, much more so than the open screen cages we have been shipping in in the past.

2nd. The feeder uses pure sugar syrup. Better than Honey or Candy to ship on; it contains water as well as feed.

3rd. Feeders are made more substantial, one-third larger, an have screw cap that will not jar out.

4th. Instead of one small hole, we now use a cotton duck washer in the screw cap that has proven to overcome all the objections found to the liquid feed method.

5th. The Cage is one piece screen wire, protected by thin boards on the outside. Send for circular describing the cage in detail, prices, etc.

ORDERS are coming in daily for 1921 SHIPPING.
Will book your order with 20 per cent down, balance just before shipping

QUEENS PACKAGE BEES QUEENS

My free circular gives prices in detail, etc. Safe delivery guaranteed within 6 days of shipping point. We ship thousands of pounds all over U. S. A. and Canada.

1 pound pkg. bees $3.00 each, 25 or more $2 85 each
2-pound pkg. bees $5.00 each, 25 or more $4.75 each
3-pound pkg. bees $7.00 each, 25 or more $6.65 each.
F. O. B. shipping point. Add price of queen wanted.
1 Untested Queen $2 each, 25 or more $1.75 each
1 Select untested, $2.25 each, 5 or more $2 each.
1 Select Tested Queen $3.50 each, 25 or more $3.00 each
1 Tested Queen $3.00 each, 25 or more $2.70 each

NUECES COUNTY APIARIES E. B. AULT, Prop. CALALLEN, TEXAS

"SUPERIOR" FOUNDATION. Yes, we are ready for the rush

Many tons now ready for shipment, and our machines are running to utmost capacity. Use the best. If your dealer can't supply you, write us for price, stating quantity required. We also accept beeswax for foundation or supplies.

"Everything in Bee Supplies."

SUPERIOR HONEY CO., Ogden, Utah (Manufacturers of Weed Process Foundation)

ITALIAN BEES AND QUEENS OF PURE THREE BAND STOCK

Bred from best hustlers, by methods that years of experience have taught us are best, including the use of large, strong, nuclei, which insures young queens emerging strong and vigorous. Safe arrival in U. S. and Canada. Health certificate with each shipment. Satisfaction guaranteed.

Untested, 1 to 12, inclusive, $1.50 each; over 12, $1.25 each.
Select untested, 1 to 12, inclusive, $1.75 each; over 12, $1.50 each
Tested, 1 to 12, inclusive, $2.50 each; over 12, $2.25 each.
Select tested, suitable for breeders, $5.00 each.
Two-frame nuclei, $5.00 each. Three-frame nuclei, $7.00 each.
Add price of queen wanted with each.
Eight-frame colony, $15.00. Ten-frame colony, $17.50.
All standard equipment and wired frames.

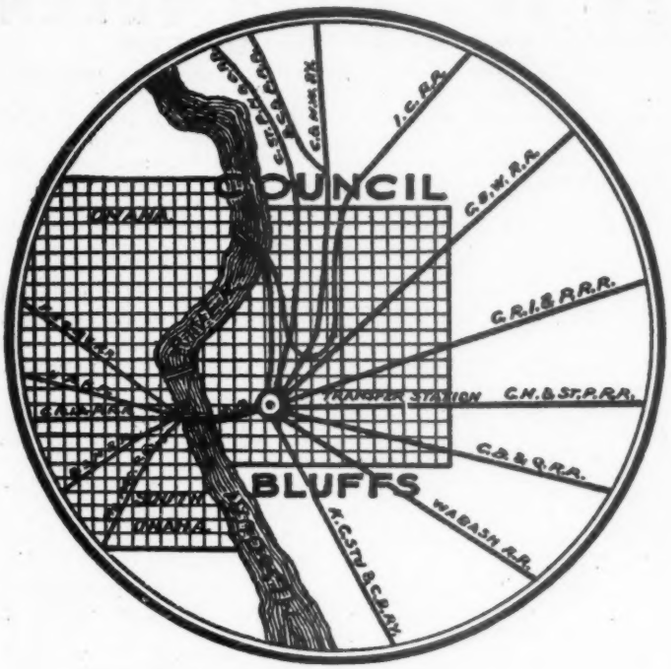
JENSEN'S APIARIES, Crawford, Miss. R. F. D. No. 3

WESTERN BEEKEEPERS!

We handle the finest line of bee supplies. Send for our 68-page catalog. Our prices will interest you.

The Colorado Honey Producers' Association, 1424 Market St., Denver, Colo.

VIGOROUS YOUNG ITALIAN PROLIFIC LAYING
LOGAN $2.00 QUEEN
DOOLITTLE STRAIN
ORDER NOW
ALL QUEENS ARE
LAYING BEFORE SHIPMENT
Shipment After May 15, Alton L. Logan, Edwardsville, Ill.



ONE REASON WHY—

we can serve western beekeepers to their advantage is because nine trunk lines run from our siding into all parts of the west. That's why we can get supplies to you quickly, and at a saving of time and freight charges. If you are in need of supplies let us serve you.

HIVES	**COVERS**	**HOFFMAN FRAMES**
SUPERS	**BOTTOMS**	**TINNED WIRE**

ESCAPE BOARDS	**HONEY CONTAINERS**
HONEY BOARDS	**ROOT SMOKERS**

THE ROOT QUALITY SECTIONS
THE NEW FOUNDATION—AIRCO

ALL OF THE ROOT QUALITY

Our Business—Producing Such a Quality
Our Specialty—Service all the Time

THE A. I. ROOT CO. OF IOWA
COUNCIL BLUFFS, IOWA

LILLY'S
Established 1885

Seattle
Yakima
Ellensburg
Wapato
Portland

HEADQUARTERS FOR

LEWIS BEEWARE
DADANT FOUNDATION
WESTERN PINE HIVES

Write Us. It Pays

LILLY'S Established 1885 — The Chas. H. Lilly Co.
Seattle, Yakima, Portland

PORTER BEE ESCAPE SAVES HONEY TIME MONEY

For sale by all dealers.
If no dealer, write factory
R. & E. C. PORTER, MFRS.
Lewistown, Illinois, U. S. A.

(Please mention Am. Bee Journal when writing)

A NEW BEE BOOK
"Dadant's System of Beekeeping"
Send for a copy today.
Price $1.00.

HIGHEST QUALITY OF ITALIAN QUEENS

3-BANDED Twenty-Five Years of Select Breeding from the Best **GOLDEN**

After 25 years of select breeding, not all of the time in a commercial way, but as large honey producers, therefore rearing a great number of queens for our own use, we have a strain of pure Italian bees which we believe are unexcelled for honey production, disease-resisting qualities and gentleness. Owning about 1,500 colonies of bees which we run for honey, gives us ample opportunity to test them out in every way. As our apiary interests extend as far north as Northern Ontario, we have a chance to test them from a climatic standpoint, in person. We therefore find that our bees will stand the long winters with very satisfactory results. You will find them very hardy and long-lived.

What Others Say About Them

M. C. Berry & Co., Hayneville, Ala.

"The queens I got from you have all others 'skinned.' They are very gentle, best of workers and stand the long winters here fine. Other queens coming from shorter distances do not hold a candle with them." Gilbert Plains, Man., Canada. (Name on request).

M. C. Berry & Co., Hayneville, Ala.

"The best queens I ever had have come from you." Great Harrington, Mass. (Name on request).

M. C. Berry & Co., Hayneville, Ala.

"I wish to inform you that one of your queens made the most honey of any in the yard. It made 250 pounds of honey against an average of 103 pounds for the yard. All of your queens made good. I never have had a queen from you that did not return a big per cent on the investment." Marion, Ind. (Name on request).

M. C. Berry & Co., Hayneville, Ala.

"I am pleased to say that your bees have given me every satisfaction in every way." Toronto, Canada. (Name on request).

M. C. Berry & Co., Hayneville, Ala.

"The introduction of your queens into six colonies of bees that had European foulbrood cleaned up the disease." Pine Ridge, N. Y. (Name on request).

Price List of Our Queens

Untested	$1.50 each; 6 to 50, $1.25 each; 50 to 100 and up, $1.00 each
Select untested	$1.75 each; 6 to 50, $1.50 each; 50 to 100 and up, $1.25 each
Tested	$2.25 each; 6 to 50, $2.10 each; 50 to 100 and up, $2.00 each
Select Tested	$3.00 each; 6 to 50, $2.75 each; 50 to 100 and up, $2.50 each

Queens by return mail when desired. Wings clipped free of charge on request. Satisfaction and safe arrival guaranteed.

M. C. BERRY & CO., Hayneville, Alabama, U. S. A.

ITALIAN BEES AND QUEENS

Guaranteed to Give You Satisfaction

Untested Queens, $1.25 each; 12 or more $1.00 each

After June 15

Untested Queens $1 each: 12 or more 75c each · Tested Queens $2 each; Breeders $5 to $25

NUCLEI

One frame, no queen	$2.00
Two frame, no queen	3.75
Three frame, no queen	5.25

POUND PACKAGES

One pound package, no queen	2.00
Two pound package, no queen	3.75
Three pound package, no queen	5.25

Add price of queen wanted

FULL COLONIES

New painted hives, good combs, young tested queens

Colony in eight-frame hive	20.00
Colony in ten-frame hive	22.00

BEE SUPPLY SPECIALS

100,000 "A" grade sections in 4¼x4¼x1-⅞; 4¼x4¼x1½ and 4x5x1⅜ at $15.00 per 1000.

Shipping Cases for above sections at 65c each. Quality as good as can be had.

A job lot of good standard **Cypress Covers and Bottoms** in packages of five, made of ⅞ lumber thruout at 55c cach.

HOFFMAN FRAMES

Made of Cypress at	$6 per 100
White pine, best frame made	8 per 100

A lot of other bargains. Let us quote you. Send for catalog of Cypress Bee Supplies

THE STOVER APIARIES, MAYHEW, MISSISSIPPI

Lumber that Lasts?

Here's a Convincing Case of an Experienced Beekeeper who—

(But let the gentleman tell it himself:)

BUCK GROVE, IOWA, February 2, 1916.

"I have been a Cypress man for lo, these many moons. Almost all my dovetail hives are of Cypress, as are bottom-boards, and I think, shallow telescope covers. My hive stands are of Cypress, and stand in the mud and wet all the time and are as solid as when I got the first one some years ago. Cypress is a trifle heavier than white (cork) pine, but not much more than the heavier grade of pine now used. The fact that it is 'everlasting' compensates for all this." *(Signed) A. F. BONNEY, M. D.*

For a job of repairing or for equipment, the lumber that will give you the greatest real investment value in the market is Cypress, commonly known as the "Wood Eternal." This wood does not rot down like most woods; it lasts and lasts and LASTS, and LASTS and LASTS. It is the Gopher Wood of the Bible—Noah built his ark of Cypress. Since the days of Noah, Cypress has been famous for endurance under the most trying conditions. **Cypress is the one certified Greenhouse wood. That's "some" test. Bottom boards are another.**

GET A BOOK—IT IS FREE

There are 42 volumes in the internationally famous Cypress Pocket Library, and each is authoritative in its field, and all are FREE. Vol. 1 is the U. S. Gov't Report on Cypress—that is a good authority, surely. Vol. 4 is the Barn Book, with plans and specifications for building. Vol. 36 is the Carpentry Book, making easy a dozen hard jobs of carpentry. Vol. 19 is the Canoe and Boat Book. Vol. 37 is the Silo Book. All are free for the asking. Suppose you ask for one or a dozen, right away.

WORTH INVESTIGATING

This Cypress wood matter is worth investigating. Just write our "All-round Helps Department."

SOUTHERN CYPRESS MANUFACTURERS ASSOCIATION

1251 HEARD NATIONAL BANK BUILDING, JACKSONVILLE, FLA. — 1251 PERDIDO BUILDING, NEW ORLEANS, LA

FOR QUICK SERVICE, ADDRESS NEAREST POST OFFICE

OUR INTRODUCTORY OFFER OF

ALUMINUM HONEYCOMB

At 50c f. o. b. Pasadena

Makes them cheaper than Wax Combs. Figure the cost

Cost of frames ..... ?
Cost of foundation ..... ?
Cost of wire ..... ?
Cost of labor (Nailing, wiring, putting in foundation) ..... ?
How much honey is used in drawing out foundation ..... ?
Value of this honey ..... ?

Total cost

Compare your figures with our price for a complete aluminum honeycomb ..... $. 50

which cannot be destroyed by moths or rodents. Increases production. Makes extracting of heavy honey easy. Prevents loss by melting. Controls production of drones. **Can be Sterilized.** Lasts forever with reasonable care.

DUFFY-DIEHL, Inc.

17 S. Chester Street — **Pasadena, Cal.**

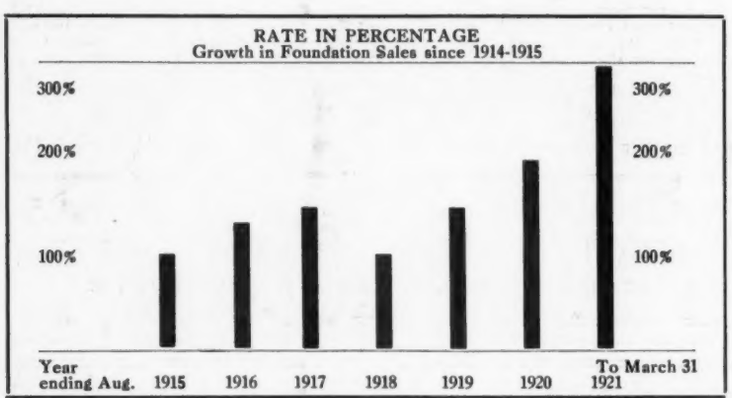
DIAMOND MATCH CO., Apiary Dept., CHICO, CAL., Sole Distributors

A GREAT RECORD

MADE BY

AIRCO COMB FOUNDATION

In this chart, the total sales for the year ending August 1, 1915, is used as the measuring stick for the following years. Sales from August 1, 1920, to date are at a rate that will make the full year's sales fully three times (or 300% of) the sales for 1915. This will be a 200% increase over 1915.



A record to be proud of—one which shows that beekeepers appreciate real values

Use Airco Foundation this Season, then be your own judge of its merits.

Price per pound packed in boxes as follows

	Medium		Light Brood		Thin		Extra Thin	
One 1-lb. box	B511001	$1.00	B521001	$1.03	B535001	$1.08	B545001	$1.10
One 2-lb. box	B511002	.95	B521002	.98	B535002	1.03	B545002	1.05
One 5-lb. box	B511003	.92	B521003	.95	B535003	1.00	B545003	1.02

Full sheets will be cut for sections and boxed, with paper between the sheets at an extra charge of 10c per lb.

For your convenience, prompt service, and saving on carriers' charges you can address the A. I. Root Co., at any of the following points where Airco Foundation is always in stock.

Chicago, 224 W. Huron St.
St. Paul, 290 E. Sixth St.
Indianapolis, 873 Massachusetts Ave
Council Bluffs, Iowa
San Antonio, P. O Box 765
Los Angeles, 1824 E. 15th St.
San Francisco, 52-54 Main St.
New Orleans, 224 Poydras St.
New York, 23 Leonard St.
Philadelphia, 8-10 Vine St.
Norfolk, 10 Commerce St.
Syracuse, 1631 W. Genesee St.

THE A. I. ROOT COMPANY, West Side Station, MEDINA, OHIO